PHASE 2 GEOPROBE SOIL INVESTIGATION WORK PLAN

JORGENSEN FORGE OUTFALL SITE

CERCLA Docket No. 10-2011-0017 8531 EAST MARGINAL WAY SEATTLE, WASHINGTON

Submitted by:

Farallon Consulting, L.L.C. 975 5th Avenue Northwest Issaquah, Washington 98027

Anchor QEA, L.L.C. 720 Olive Way, Suite 1900 Seattle, Washington 98101

Farallon PN: 394-001

For:

Jorgensen Forge Corporation 8531 East Marginal Way Seattle, Washington

The Boeing Company PO Box 3707, MC 9U4-26 Seattle, Washington 98124

February 2012

TABLE OF CONTENTS

ACRONYMS AND ABBREVIATIONSiv					
1.0	INTR	ODUCTION	. 1-1		
	1.1	WORK PLAN PURPOSE			
	1.2	INVESTIGATION OBJECTIVE			
	1.3	SCOPE OF WORK	. 1-3		
	1.4	ORGANIZATION	. 1-3		
2.0	SITE	DESCRIPTION AND BACKGROUND			
	2.1	PHASE 1 INVESTIGATION RESULTS	. 2-1		
3.0	SAMPLE LOCATIONS AND SAMPLING FREQUENCY				
	3.1	GEOPROBE BORINGS	. 3-1		
4.0	SAMPLE PROCEDURES, DESIGNATION, AND LABORATORY				
		YSIS			
	4.1	SAMPLING PROCEDURES			
	4.2	4.1.1 Soil Sampling			
	4.2	LABORATORY ANALYSES			
	4.3 4.4	DECONTAMINATION PROCEDURES			
	4.4	DECONTAININATION PROCEDURES	. 4-4		
5.0	SAMP	PLE HANDLING	. 5-1		
	5.1	SAMPLE CONTAINERS, PRESERVATION, AND HOLD TIMES	. 5-1		
	5.2	SAMPLE PACKAGING AND SHIPMENT	. 5-1		
	5.3	SAMPLE DOCUMENTATION	. 5-2		
	5.4	FIELD QUALITY ASSURANCE/QUALITY CONTROL			
		SAMPLES			
		5.4.1 Field Duplicates			
		5.4.2 Equipment Rinsate Sampling	. 5-3		
		5.4.3 Blank Sampling	. 5-3		
6.0		TE MANAGEMENT			
	6.1	WASTE SOIL			
	6.2	WASTEWATER			
	6.3	DISPOSABLES	. 6-2		
7.0		D DOCUMENTATION			
	7.1	FIELD REPORT FORM			
	7.2	LOG OF BORING FORM			
	7.3	SOIL SAMPLE DATA FORM			
	7.4	WASTE INVENTORY TRACKING SHEET			
	7.5	SAMPLE LABELSWASTE MATERIAL LABEL			
	7.6 7.7	CHAIN OF CUSTODY			
	1.1	CHAIN OF CUSTOD I	. 1-2		

8.0	QUA	LITY ASSURANCE PROJECT PLAN	8-1	
	8.1	RESPONSIBILITIES OF KEY PERSONNEL	8-1	
		8.1.1 Project Manager	8-1	
		8.1.2 QA/QC Officers		
		8.1.3 Project Staff	8-1	
		8.1.4 Regulatory Agency	8-1	
		8.1.5 Document Control Clerk	8-2	
	8.2	DATA QUALITY OBJECTIVES	8-2	
		8.2.1 Precision	8-2	
		8.2.2 Representativeness	8-2	
		8.2.3 Completeness	8-3	
		8.2.4 Comparability	8-3	
	8.3	CALIBRATION PROCEDURES	8-3	
	8.4	SAMPLING PROCEDURES	8-3	
	8.5	ANALYTICAL PROCEDURES	8-3	
	8.6	DATA MANAGEMENT, REDUCTION, REVIEW, AND		
		REPORTING	8-3	
		8.6.1 Data Types	8-4	
		8.6.2 Data Transfer		
		8.6.3 Data Inventory		
		8.6.4 Data Reduction and Analysis		
		8.6.5 Telephone Logs, Meeting Notes, and Field Notes		
	8.7	QUALITY ASSURANCE/QUALITY CONTROL PROCEDURES	8-5	
		8.7.1 Field Quality Control	8-6	
		8.7.2 Data Quality Control		
	8.8	PERFORMANCE AND SYSTEM AUDITS		
	8.9	DATA ASSESSMENT PROCEDURES	8-6	
	8.10	CORRECTIVE ACTION	8-6	
9.0	DELIVERABLES AND SCHEDULE			
	9.1	SUMMARY REPORT		
	9.2	SCHEDULE	9-1	
10.0	REFI	ERENCES	. 10-1	

FIGURES

Figure 2 Phase 1 Investigation Results

Figure 3 Proposed Phase 2 Geoprobe Soil Investigation Boring Locations

TABLE

Table 1 Container, Preservation, and Hold Time Requirements

APPENDICES

Appendix A Health and Safety Plan

Appendix B Tables 3 through 6 from May 27, 2011 Floyd Snider Source Control Action

Completion Report

Appendix C Standard Operating Procedures

Appendix D Field Documentation Forms

ACRONYMS AND ABBREVIATIONS

Anchor Anchor QEA, L.L.C.

ARI Analytical Resources, Inc. of Tukwila, Washington

bgs below ground surface

Boeing The Boeing Company

Geoprobe Soil Investigation Phase 2 Geoprobe Soil Investigation

DQOs data quality objectives

EPA U.S. Environmental Protection Agency

Farallon Farallon Consulting, L.L.C.

FloydSnider Floyd|Snider, Inc.

Jorgensen Forge Corporation

Jorgensen Forge Outfall Site at 8531 East Marginal Way South in

Outfall Site Seattle, Washington

LDW Lower Duwamish Waterway

mg/kg milligrams per kilogram

MTCA Washington State Model Toxics Control Act Cleanup Regulation

PCBs polychlorinated biphenyls

QA/QC quality assurance/quality control

Work Plan Phase 2 Geoprobe Soil Investigation Work Plan dated February

2012 developed by Farallon Consulting, L.L.C. and Anchor QEA,

L.L.C.

1.0 INTRODUCTION

This Phase 2 Geoprobe Soil Investigation (Geoprobe Soil Investigation) Work Plan (Work Plan) has been developed by Farallon Consulting, L.L.C. (Farallon) and Anchor QEA, L.L.C. (Anchor) on behalf of Jorgensen Forge Corporation (Jorgensen) and The Boeing Company (Boeing) to present the scope of work for additional investigation to be conducted at the Jorgensen Forge Outfall Site at 8531 East Marginal Way South in Seattle, Washington (herein referred to as the Jorgensen Forge Outfall Site) (Figure 1). The Geoprobe Soil Investigation is being conducted to collect additional soil data to further define the lateral and vertical extent of soil containing elevated polychlorinated biphenyls (PCBs) concentrations in the northwest corner of the Jorgensen Forge Outfall Site and the adjacent part of the Boeing's Plant 2 property.

As discussed in Section 2, a Phase 1 Investigation was conducted by Boeing and Jorgensen at the Jorgensen Forge Outfall Site in February 2011 which included advancing Geoprobe borings along three transects perpendicular to the shoreline to evaluate whether a release of hazardous substances had occurred to subsurface soil beneath the 15-inch and 24-inch pipes located on the Jorgensen Forge Outfall Site (Figure 1). The Phase 1 Investigation was conducted in accordance with the *Source Control Action*, *15-inch and 24-inch Pipes Cleanout Work Plan* dated November 23, 2010 prepared by Floyd Snider (2010) and the U.S. Environmental Protection Agency (EPA) Administrative Order on Consent for Removal Action, CERCLA Docket No. 10-2011-0017 (AOC) entered into by Jorgensen and Boeing.

The results of the Phase 1 Investigation identified elevated PCB concentrations in soil at depths from 8 to 25 feet below ground surface (bgs) in the vicinity of the northwest corner (Floyd Snider 2011) of the Jorgensen Forge Outfall Site. The Jorgensen Forge Outfall Site is located within the Lower Duwamish Waterway (LDW) Superfund Site (Figure 1). Further investigation is necessary to assess the extent of the elevated PCB concentrations encountered during the Phase 1 Investigation and to identify and define necessary future cleanup activities in this area. Future cleanup in this area will be conducted in conjunction with the sediment removal actions scheduled to commence in the LDW adjacent to Jorgensen property and Boeing Plant 2 property in 2012 (Figure 1).

This Work Plan has been prepared to meet the requirements of the EPA First Modification to the AOC (Modified Order) entered into by Jorgensen and Boeing in September 2011.

1.1 WORK PLAN PURPOSE

The Work Plan describes the project objectives and organization, functional activities, and quality assurance/quality control (QA/QC) protocols that will be used to complete the Geoprobe Soil Investigation. The purpose of the Work Plan is to:

- Provide the rationale for the scope of work to be performed for the Geoprobe Soil Investigation;
- Present detailed methods for sampling and analysis;
- Identify data quality objectives (DQOs);

- Provide a preliminary schedule for completion of the Geoprobe Soil Investigation; and,
- Provide a summary of the elements to be included in the Phase 2 Geoprobe Soil Investigation Summary Report.

The Work Plan includes a Health and Safety Plan (Appendix A). Appendix A should be read in conjunction with the entire Work Plan.

1.2 INVESTIGATION OBJECTIVE

The objectives of the Geoprobe Soil Investigation are to fulfill the Modified Order by completing the following:

- 1. Determining the lateral and vertical extent of soil containing concentrations of polychlorinated biphenyls (PCBs) above 1 milligram per kilogram (mg/kg) in the vicinity of Phase 1 borings T1B3 and T2B4.
- 2. If necessary, submitting archived samples for additional chemical analysis to evaluate the extent of any removal action with respect to waste management/disposal suitability, worker safety, and sediment protectiveness.
- 3. Evaluating the association between debris fill in the vicinity of the outfalls and possible PCB and other chemical occurrences, if analyzed as part of Objective 2.

Regarding Objective #1, the Washington State Model Toxics Control Act (MTCA) Method A cleanup level of 1 mg/kg was selected as a preliminary screening level for the Jorgensen Forge Outfall Site to support the general delineation of elevated PCB concentrations in soil (as discussed in Section 3.1). This screening level is not considered a cleanup level at this time. A final PCB cleanup level will be determined as part of future soil cleanup activities in this area, if necessary.

Regarding Objective #2, submitting archived samples collected during the Geoprobe Soil Investigation for additional chemical analysis, if necessary, following completion of Objective 1. These data, if required, will be used to evaluate various remedial actions, in particular determining the waste classification of any soil that may be excavated, worker safety requirements, and the extent to which potentially contaminated soil would be protective of the adjacent sediment following any future, potential removal action.

Regarding Objective #3, the Geoprobe Soil Investigation will assess boring log information for the distribution of debris fill to evaluate the possible association between debris fill and possible elevated levels of PCBs and other chemicals that may be analyzed as part of Objective 2, if necessary.

1.3 SCOPE OF WORK

The scope of work for the Geoprobe Soil Investigation will include:

- Advancement of 13 Geoprobe borings; and
- Collection and laboratory analysis of soil samples.

The Geoprobe borings will be advanced using direct-push drilling technology at the preliminary locations depicted on Figure 3. The Geoprobe borings will be completed on the northwest portion of the Jorgensen Forge Outfall Site and the adjacent part of the Plant 2 property. Based on the results of the Phase 1 Investigation discussed in Section 2.1, the Geoprobe borings will be advanced to an approximate total depth of 35 feet below ground surface (bgs). This depth will allow the collection of samples into the native soil and, therefore, bound the lower limits of contamination that appears to mainly occur within overlying fill materials. Details pertaining to sample locations and sampling frequency, and sampling procedures and laboratory analyses are presented in Sections 3 and 4, respectively. A Health and Safety Plan for the field portion of the Work Plan is provided in Appendix A.

1.4 ORGANIZATION

The Work Plan is organized into the following sections:

Section 1—Introduction. This section presents the purpose of the Work Plan, the investigation objective, and the scope of work.

Section 2—Site Description and Background. Section 2 provides a description of the Jorgensen Forge Outfall Site and location relative to the LDW, and a summary of the Phase 1 Investigation conducted at the Site.

Section 3—Sample Locations and Sampling Frequency. Section 3 provides a description of the soil sample locations and sample collection frequency.

Section 4—Sampling Procedures, Designation, and Laboratory Analysis. Section 4 provides details on the sampling procedures and equipment, sample designation and numbering, and laboratory analyses to be conducted.

Section 5—Sample Handling. Section 5 provides details on soil sampling containers, preservation and hold times, and sample packaging and shipment.

Section 6—Waste Management. Section 6 describes waste sampling, profiling, and handling.

Section 7—Field Documentation. Section 7 summarizes field documentation procedures.

Section 8—Quality Assurance Project Plan. Section 8 summarizes the DQOs, sampling procedures, and data assessment methods to be used in implementing the Work Plan.

Section 9—Deliverables and Schedule. Section 9 summarizes the information to be included in the Phase 2 Geoprobe Soil Investigation Summary Report, and provides a preliminary schedule for implementing the Work Plan.

Section 10—References. Section 10 lists the documents referenced in preparing the Work Plan.

2.0 SITE DESCRIPTION AND BACKGROUND

The Jorgensen Forge Outfall Site is the location of a 24-inch pipe and adjacent 15-inch pipe (collectively referred to herein as the Pipes) located along the northern boundary of the currently operating Jorgensen facility (Figure 1). The Pipes historically discharged stormwater (in some instances containing hazardous substances, including PCBs) into the LDW, as documented in the Action Memorandum dated September 30, 2010 prepared by EPA (2010). The Boeing-owned and operated Plant 2 facility bordering the Jorgensen facility to the north, as well as portions of King County International Airport, the City of Tukwila, and the historic Bethlehem Steel Facility located on the Jorgensen property, have contributed stormwater that ultimately discharged from the Pipes. Additional background information on the Pipes is provided in the *Source Control Action*, 15-inch and 24-inch Pipes Cleanout Work Plan (Floyd Snider 2010).

2.1 PHASE 1 INVESTIGATION RESULTS

A Phase 1 Investigation was conducted by Boeing and Jorgensen at the Jorgensen Forge Outfall Site in February 2011 in accordance with the *Source Control Action*, *15-inch and 24-inch Pipes Cleanout Work Plan* (Floyd Snider 2010). The Phase 1 Investigation was performed prior to the cleaning and sealing of the clay sections of the Pipes. The investigation included advancing Geoprobe borings along three transects perpendicular to the shoreline to evaluate whether a release of hazardous substances associated with the corrugated metal pipe (CMP) portion of the Pipes (approximately the last 100 feet of the down-gradient portions of the Pipes) had occurred to subsurface soils.

The Geoprobe borings advanced during the Phase 1 Investigation identified total PCBs above 1 mg/kg (Figure 2) (Appendix B) Soil samples were collected from each Geoprobe boring at the following depths below ground surface (bgs): approximately midway between the ground surface and the top of the Pipes (ranged from 2 and 5 feet bgs); near the base of the Pipes (8 to 10 feet bgs); and approximately 2 feet below the assumed fill material-native soil interface (ranged from 13 to 25 feet bgs). Reconnaissance groundwater samples were collected using a temporary well screen pushed into the upper 5 to 10 feet of the water table, approximately 15 to 20 feet bgs. Soil samples were analyzed based on the presence of observed fill material. Samples from areas with no observed fill were archived with the analytical laboratory. The results of the Phase 1 Investigation were documented in the *Source Control Action Completion Report, Jorgensen Forge Outfall Site, Seattle, Washington* prepared by Floyd Snider (2011) dated May 27, 2011 and approved by EPA on July 15, 2011. EPA indicated in its approval letter that the Phase I Investigation fulfilled the requirements of the AOC.

Soil samples collected from the Geoprobe borings T1B1, T1B3, and T2B4 contained concentrations of total PCBs exceeding 1 mg/kg (Figure 2). Based on the results of the Phase 1 Investigation, additional Geoprobe borings in the vicinity of Geoprobe borings T1B3 and T2B4 are necessary to achieve the Work Plan objectives identified in Section 1.2. Additional investigation to assess the extent of PCBs exceeding 1 mg/kg detected at Geoprobe boring T1B1 have previously been conducted by Boeing under a Resource Conservation and Recovery Act Corrective Action

3.0 SAMPLE LOCATIONS AND SAMPLING FREQUENCY

This section summarizes the sample locations and frequency of soil sample collection for the Geoprobe Soil Investigation. Standard Operating Procedures for field operations are provided in Appendix C.

3.1 GEOPROBE BORINGS

Additional Geoprobe soil borings will be completed to further define the lateral and vertical extent of PCBs in the vicinity of the CMP portions of the Pipes of the Jorgensen Forge Outfall Site. The proposed Geoprobe soil boring locations are shown on Figure 3 and the rationale for the boring locations is provided in this section.

As shown on Figure 3, the Geoprobe borings have been designated as primary, secondary or tertiary. Although a Geoprobe soil boring will be completed for each of these designations and sub-sampled as described in Section 4, laboratory analysis will be conducted in a stepwise fashion based on the designations. Specifically, each of the primary Geoprobe soil boring subsamples will be submitted for PCB laboratory analysis immediately following collection. The secondary Geoprobe boring soil samples will be submitted for PCB laboratory analysis only as necessary to fulfill project objectives. The following criteria will be used to determine the need for analysis of PCBs and other analytes, if necessary, in samples from secondary borings:

- If the closest primary boring contains total PCB concentrations greater than 1 mg/kg; or
- If field indications suggest the presence of contamination (e.g. debris fill, strong sheen or elevated PID readings) is observed by the field personnel.

The following criteria will be used to determine the need for analysis of PCBs and other analytes, if necessary, in samples from the tertiary boring:

- If the closest secondary soil boring contains total PCB concentrations greater than 1 mg/kg, or
- If field indications suggest the presence of contamination (e.g., debris fill, strong sheen or elevated PID readings)

A detailed description of the proposed sampling locations and rationale at each of these Geoprobe borings is provided below.

Primary Geoprobe soil borings JF-DGP1, JF-DGP2, JF-DGP4, JF-DGP5, and B-DGP1 will be completed at distances of approximately 10 to 20 feet from the location of Geoprobe soil boring T2B4 completed during the Phase 1 Investigation. Concentrations of total PCBs in boring T2B4 exceeding 1 mg/kg were detected in soil at 3 to 5 feet, 18 to 20 feet, and 23 to 25 feet bgs. These primary Geoprobe soil borings will be completed to collect additional soil samples for laboratory analysis to further evaluate the lateral and vertical distribution of total PCBs exceeding 1 mg/kg surrounding boring T2B4. Similarly, primary Geoprobe borings JF-DGP3 will be completed at a distance of approximately 10 feet from the location of boring T1B3 completed during the Phase

1 Investigation, where concentrations of total PCBs exceeded 1 mg/kg. This Geoprobe boring will be completed to collect additional soil samples for laboratory analysis to further evaluate the lateral and vertical distribution of PCBs exceeding 1 mg/kg surrounding boring T1B3.

Secondary Geoprobe soil borings JF-DGS1 through JF-DGS3, and B-DGS1 and B-DGS2will be completed to further evaluate the lateral and vertical extent of PCBs in soil exceeding 1 mg/kg, with laboratory analysis contingent on the results for soil samples collected from the closest primary Geoprobe soil borings. Similarly, tertiary Geoprobe soil boring JF-DGT1 will be completed to further evaluate the lateral and vertical extent of PCBs in soil exceeding 1 mg/kg, with laboratory analysis contingent on the results for soil samples collected from the closest secondary Geoprobe soil boring.

The Geoprobe borings will be completed using a truck-mounted Geoprobe. Soil samples from the Geoprobe borings will be collected continuously in 2-foot intervals, beginning at the ground surface and extending to a minimum depth of 5 feet into the native soil layer, expected to occur between 10 to 25 feet bgs. The native soil layer will be identified by the field geologist during boring logging. Volume permitting, additional soil volume from sampling intervals may be retained for potential future laboratory analysis. The rationale for selection of soil samples for laboratory analysis of PCBs, and potentially other analytes, is provided above.

Additional Geoprobe borings may be advanced adjacent to initial boring locations if sufficient soil sample recovery is not achieved to collect a minimum of one sample in a contiguous 4-foot section of vertical boring depth, independent of the individual sample interval pushed by the Geoprobe rig, which may vary. In locations where this occurs, up to three additional Geoprobe boring will be located within 3 feet of the first attempt, subject to access conditions, sufficient to satisfy the objectives identified in Section 1.2.

4.0 SAMPLE PROCEDURES, DESIGNATION, AND LABORATORY ANALYSIS

This section summarizes the sampling procedures, sample designation protocols, and laboratory analysis that will be carried out for the soil samples collected at the Jorgensen Forge Outfall Site.

4.1 SAMPLING PROCEDURES

The field sampling procedures are described in the section below. Field sampling data will be recorded and documented on field forms as described in Section 7. The one-call utility location service and a private utility location service will be contacted to confirm the locations of subsurface utilities before any drilling activities are performed.

4.1.1 Soil Sampling

Soil samples will be collected from the Geoprobe borings identified in Section 3.1 for potential laboratory analysis. The soil samples will be collected and handled in accordance with the following procedures:

- Soil samples will be collected directly from the Geoprobe sampler using either stainless steel or plastic sampling tools. Non-dedicated and non-disposable sampling equipment will be decontaminated between uses, as appropriate.
- Soil cores will be digitally photographed, with respective boring identification and sample location markers visible in the photos.
- The following information at a minimum will be logged during boring: sample depth, Unified Soil Classification System description, soil moisture, occurrence of groundwater, physical indications of potential contamination (e.g., odor, staining), and field-screening results obtained using a photoionization detector.
- The soil sample will be transferred immediately into laboratory-supplied sample containers. Care will be taken not to handle the seal or inside cap of the container when the sample is placed into the containers. The containers will be filled to eliminate headspace, and the seals/caps will be secured.
- The sample container will be labeled with the media, date, time sampled, sample identification and number, project name, project number, and sampler's initials.
- The sample will be logged on a Chain of Custody form and placed into a cooler at approximately 4 degrees Celsius for transport to the laboratory under chain-of-custody protocols.
- QA/QC samples will be collected at the designated frequency identified in Section 5.4.
- Disposable sampling and health and safety supplies and equipment will be discarded in an appropriate waste dumpster and handled and disposed using the procedures identified in Section 6.3.

 The sample location will be determined to sub-meter accuracy using a differential global positioning system and using a measuring tape or other measuring device relative to a landmark.

The Geoprobe borings will be advanced using 3-inch-diameter steel casing from a truck-mounted Geoprobe rig extending from the surface to between 15 to 30 feet bgs, which is estimated to be a minimum of 5 feet into native soil based on the soil lithology identified during the Phase 1 Investigation. The 3-inch-diameter steel casing will be lined with a disposable acetate sleeve that will be removed and opened to reveal each 4-foot maximum sample interval. The intervals pushed by the Geoprobe rig may be less than 4 feet based on subsurface conditions encountered, and will be advanced in such a way as to maximize sample recovery. Boring locations may be adjusted within an approximately 5-foot radius of the target location based on locations of utilities or other access conditions. At locations where sample interval recovery is less than 75 percent, a 2-foot-interval sample and an incomplete interval sample will be collected. For example, 3 feet of recovery from a 4-foot sample interval would result in collection of a single 2-foot-interval sample and a single 1-foot-interval sample.

Coarse gravel and cobbles will be removed from the sample interval prior to sample collection. One soil sample for every 2 feet of vertical boring depth will be collected beginning at surface grade and prepared for potential laboratory analysis by homogenizing the sample (e.g. one sample will be collected from 0 to 2 feet bgs, one sample from 2 to 4 feet bgs, etc.). As discussed in Section 3.1, if sample intervals within a Geoprobe boring have significant and consistent recovery problems such that the Geoprobe soil investigation objectives may not be fulfilled, up to three additional Geoprobe borings may be reinitiated at a proximate location no more than 3 feet from the initial location, subject to access conditions, sufficient to satisfy the objectives as stated in Section 1.2.

All soil samples collected will be submitted to the laboratory and retained at the laboratory for potential laboratory analysis.

4.2 SAMPLE DESIGNATION

Each sample collected will be assigned a unique sample identifier and number, which will be written in indelible ink on the sample label affixed to the sample containers immediately prior to sample collection. The sample labels will include the following additional information: client name, project name and number, date and time of sample collection, sampler's initials, analytical method, and analyte preservative(s), if any. A Soil Sample Data form will be maintained as each sample is collected and will include the sample location and depth, the sample number and identifier, and other observations regarding the sample. The sample identification will be recorded also on the Log of Boring and the Chain of Custody form.

Soil samples collected from the Geoprobe borings will be assigned a unique sample identifier that will include the five components listed below:

GEOPROBE BORINGS						
Location:	JF (Jorgensen property), B (Boeing property)					
Type:	DGP1 (Data Gap Primary location 1), DGS1 (Data Gap Secondary location 1), DGT1 (Data Gap Tertiary location 1)					
Media:	SO (soil)					
Start Depth:	01 through 99 feet bgs (two digits)					
End Depth:	01 through 99 feet bgs (two digits)					
Example Label:	JF-DGP1-SO-08-10					
Example Euroei.	A soil sample at primary location 1 collected starting at 8 feet bgs and ending at 10 feet bgs on Jorgensen property.					
	B-DGS4-SO-02-04					
	A soil sample at secondary location 4 collected starting at 2 feet bgs and ending at 4 feet bgs on Boeing property.					
SOIL QA/QC SAMPLES						
Duplicate	D					
Example Label	JF-DGP2-SO-08-10-D					
Duplicate:	A duplicate sample of a soil material sample will be identified as above, with the suffix "D".					
	Equipment Rinsate QA/QC Samples					
Equipment Rinsate	ER					
Example Label:	JF-DGP2-SO-08-10-ER					
	A sample collected of the final water rinse after reusable sampling equipment decontamination will be identified as above, with the suffix "ER".					
Field Blank QA/QC Samples						
Field Blank	FB					
Example Label:	JF-DGP2-SO-08-10-FB					
Field Blank	A sample collected to evaluate the potential of cross-contamination during sample collection will be identified as above, with the suffix "FB".					
Trip Blank QA/QC Samples						
Trip Blank	TB					
Example Label:	JF-DGP2-SO-08-10-TB					
Trip Blank	If necessary, a sample collected to evaluate the potential of cross-contamination during sample transport will be identified as above, with the suffix "TB".					

4.3 LABORATORY ANALYSES

Analyses to be conducted during the Phase 2 Geoprobe Soil Investigation are identified and described below. Established protocols for container types, hold times, analytical methods, practical quantitation limits, and method detection limits will be maintained in accordance with current regulatory guidelines, and may be modified as necessary to comply with amendments to current regulations, methods, and/or guidelines.

Analytical Resources, Inc. of Tukwila, Washington (ARI) has been selected as the laboratory to conduct sample analysis for the Phase 2 Geoprobe Soil Investigation. ARI will be responsible for the overall quality of the analytical work and will issue the final laboratory deliverables.

Soil and QA/QC samples will be collected as discussed in Sections 3.1, 4.1.1, and 5.4 and submitted to the laboratory for analysis.

All soil samples collected from the primary Geoprobe borings will be submitted for laboratory analysis for PCBs by EPA Method 8082. In addition, as described in Section 3.1, archived samples from secondary or tertiary borings may also be submitted for PCBs.

Select soil samples may be submitted for analysis of volatile organic compounds by EPA Method 8260B and/or metals by EPA Method 6010B based on field indications of contamination and PID readings elevated above observed background levels, and other chemicals, if necessary, as discussed in Section 3.1.

4.4 DECONTAMINATION PROCEDURES

Reusable non-drilling sampling equipment (e.g., stainless steel bowl, trowel) will be decontaminated before sampling activities are initiated, between sampling locations, and after sampling activities have been completed. Field sampling equipment will be pre-cleaned single use equipment or decontaminated by washing with Alconox or equivalent, wiping the sampling surfaces with methanol, rinsing with tap water, and final rinsing with deionized water.

Drilling equipment that directly contacts soil samples (e.g., drilling rods) will be decontaminated prior to the start of drilling and following completion of each boring. The drilling equipment will be decontaminated by steam cleaning. The equipment needed to decontaminate drilling equipment will be determined prior to mobilization to the field and will be provided by the drilling subcontractor.

Rinsate blanks will be collected following decontamination of equipment as discussed in Section 5.4.2

5.0 SAMPLE HANDLING

This section discusses the sample handling methods to be used for the soil samples collected for the Phase 2 Geoprobe Soil Investigation. Included are descriptions of specific procedures for sample packaging and shipment, sample documentation, and field and laboratory QA/QC samples.

Upon transfer of samples to laboratory personnel or arrival of samples at the laboratory facility, the laboratory will assume responsibility for custody of the samples. Laboratory personnel will document the status of shipping and handling containers. The laboratory will follow standard chain-of-custody protocols for tracking each sample through all stages of laboratory processing.

5.1 SAMPLE CONTAINERS, PRESERVATION, AND HOLD TIMES

Sample container requirements are based on the medium to be sampled and the types of analyses to be performed. The containers, preservation procedures, and hold times are shown in Table 1, and follow standard laboratory protocols.

5.2 SAMPLE PACKAGING AND SHIPMENT

All samples shipped for laboratory analysis will be packaged according to applicable regulations. Samples will be expeditiously transported to the analytical laboratory after being sealed in the ice chests. The sampling team may drive the samples to the laboratory, or samples will be routinely shipped by same-day or overnight courier service.

The following procedures are to be used for sample packaging and represent the minimum shipping and handling requirements:

- Sample labels will be affixed to corresponding sample containers at time of sample collection.
- Bubble wrap bags or equivalent will be used to protect glass sample bottles.
- Sample containers will be sealed in a clear zip-lock bag, placed in an ice chest, and checked against the chain-of-custody record to ensure that all samples are listed and are correctly labeled.
- A copy of the Chain of Custody form will be detached and retained.
- Remaining paperwork will be sealed in a clear zip-lock bag and the bag affixed to the inside of the ice chest.
- One to three resealable bags will be filled with ice and/or chemical equivalent and included in the ice chest shipment. All ice will be double-bagged in heavy-duty bags and/or garbage bags.
- The ice chest will be sealed with two custody seals or otherwise secured against tampering such as sealing with strapping tape.

• The laboratory address will be affixed to all ice chests.

5.3 SAMPLE DOCUMENTATION

All sample containers will be adequately identified with a durable label, and the sample identification will be recorded on the Log of Boring and Soil Sample Data and Field Report forms (Appendix D). Other sample documentation to be maintained by field personnel includes Chain of Custody forms and seals, sample labels, and shipment bills. Examples of these forms are included in Appendix D.

Sample containers will be labeled with the following information: client, project name and number, date and time sampled, sample identification, sampler's initials, analysis, and analyte preservative(s), if any.

The appropriate sample containers will be selected at the time of sampling, and the sample number for each sample will be recorded on the Log of Boring and Soil Sample Data forms. A chain-of-custody seal and/or strapping tape will be used to seal the ice chests shut before shipping. A chain-of-custody seal is used to show that no tampering has occurred between the time the ice chest was relinquished by the field personnel and when it arrived at the laboratory. The chain-of-custody seal and/or strapping tape will be attached so that it must be broken to open the shipping container. Information on the seals will be checked against sample summary log entries, and samples will be recounted before leaving the Site to verify that no samples were misplaced. Prior to transfer of the samples off the Site, chain-of-custody entries will be made for all samples using the Chain of Custody form.

Chain of Custody forms will contain the following information: sample number, sampling date and time, time the shipment was packaged, number of containers comprising each sample, description of the sample matrix, analyses required for each sample, shipment number, laboratory destination for shipping, date/time and method of shipment, and signature for custody transfer.

5.4 FIELD QUALITY ASSURANCE/QUALITY CONTROL SAMPLES

Soil duplicate, equipment rinsate, field blank, and/or trip blank QA/QC samples will be collected and analyzed with the other samples to provide for data validation for the Geoprobe Soil Investigation, as detailed in Section 8.0. The exact number of QA/QC samples will depend on the number of samples collected during the field data collection phase of the Geoprobe Soil Investigation. Field QA samples will be documented in the field notes and verified by the QA Manager or designee. Details of the field duplicate, equipment rinsate, rinsate blank, and/or trip blank samples will be kept only in the field notes to ensure that the laboratory is blind to the origin of the sample. Each field QA sample will be analyzed for PCBs by EPA Method 8082 and additional analyses as needed, as discussed in Section 3.1. Field QA/QC sample identifications are described in Section 4.2.

5.4.1 Field Duplicates

Field duplicates will be collected at a frequency of approximately 5 percent of the total number of soil sample locations, or approximately 1 QA/QC sample for every 20 soil samples. The purpose of the field duplicates is to evaluate the variability of sample concentrations due to sample processing. Field duplicate samples will be collected along with the original sample as a split from one homogenized sample. QA/QC samples will be collected and shipped to the laboratory with the other samples. The exact number of QA/QC samples will depend on the number of samples collected.

5.4.2 Equipment Rinsate Sampling

The purpose of equipment rinsate sampling is to evaluate the efficiency of decontamination and handling procedures. The equipment rinsate sample will consist of rinsing drilling equipment that will come into contact with sample material and soil sample homogenization equipment with distilled water following sample collection and decontamination using the procedures described in Section 4.4. One equipment rinsate sample will be collected for each type of sampling technique used.

5.4.3 Blank Sampling

The purpose of the blank sampling is to evaluate the potential of cross-contamination of samples during sample collection and transport. The field blank will be collected by pouring distilled water directly in the sampling containers. One field blank will be collected for each type of sampling technique used.

If one or more soil samples are selected for analysis by volatile organic compounds, a trip blank will be included in the ice chest with those samples and will be analyzed for volatile organic compounds. Trip blanks are provided by the analytical laboratory and are used to evaluate potential contamination of samples in transport. One trip blank will be included in each ice chest containing soil samples for analysis of volatile organic compounds.

6.0 WASTE MANAGEMENT

Investigation-derived waste soil, wastewater, and other products generated by field sampling may be contaminated and will be containerized and disposed of properly, pending receipt of analytical results. Waste soil and wastewater generated from Geoprobe borings located on Boeing property will be manifested and disposed of by Boeing. Waste soil and wastewater generated from Geoprobe borings located on Jorgensen property will be manifested and disposed of by Jorgensen. The criteria for tracking, sampling, and analyzing the wastes for selection of an appropriate disposal option for each of the expected waste streams are discussed below.

6.1 WASTE SOIL

Waste soil generated by the boring activities will be placed into drums provided by the facility or drilling contractor pending waste profiling. The waste soil generated from each facility will be segregated into separate drums to facilitate waste disposal, and will be tracked using a Waste Inventory form. The drums will be labeled according to content, date, origin, and level of personal protective equipment used during waste production (e.g., Level D). The drums will be temporarily stored on the facility where the sampling was performed.

Soil analytical data from the Geoprobe borings will be used to develop waste profiles, which will be provided to an appropriate landfill facility or permitted transport, storage, and disposal facility. Waste profiles and manifests will be forwarded by the generator (i.e. Boeing or Jorgensen) for approval prior to transporting the materials off the facility property. All waste soil will be removed by a licensed transporter in labeled U.S. Department of Transportation (DOT)-approved containers. The documentation for waste soil disposal will be maintained in the project file.

6.2 WASTEWATER

Wastewater generated during field activities will include decontamination water generated during drilling and sampling activities. The wastewater will be placed into drums for storage on the facility property where the sampling was performed, and will be tracked using a Waste Inventory form. It is anticipated that one wastewater drum will be generated for the drilling activities on Boeing property, and one or more wastewater drums will be generated for drilling activities on Jorgensen property.

A sample of the wastewater will be collected, submitted for laboratory analysis, and used to develop wastewater profiles. Based on the analytical results, an appropriate disposal option will be selected by the facility where the wastewater was generated. The waste profiles will be provided to the transport, storage, and disposal facility. Waste profiles and manifests will be forwarded to the generator for approval before the materials are transported off the Site. The wastewater will be removed by a licensed transporter in labeled DOT-approved containers. Wastewater disposal documentation will be maintained in the project file.

6.3 DISPOSABLES

Disposable personal protective clothing (e.g., Tyvek suits, rubber gloves, boot covers) and disposable sampling devices (e.g., plastic scoops, plastic samplers) will be cleaned, placed into plastic garbage bags, and disposed of as nonhazardous waste.

7.0 FIELD DOCUMENTATION

Field activities will be documented on Field Report forms, Log of Borings forms, Soil Sampling Data forms, Waste Inventory forms, sample and waste material labels, and Chain of Custody forms. Documentation generated during the field program will be retained in the project file and included in the reports generated, as appropriate.

7.1 FIELD REPORT FORM

Field personnel will be required to keep a daily field log on a Field Report form. Field notes will be as descriptive and inclusive as possible, allowing an independent party to reconstruct the sampling situation from the recorded information. Language will be objective, factual, and free of inappropriate terminology. A summary of each day's events will be completed on a Field Report form. At a minimum, field documentation will include the date, job number, project identification and location, weather conditions, sample collection data, personnel present and responsibilities, field equipment used, and any activities performed in a manner other than as specified in the Work Plan. In addition, if other forms or documents are completed or used (e.g., well head surveys, maps), they will be referred to and attached to the Field Report form. The Field Report form is signed by field personnel. An example of the Field Report form is provided in Appendix D.

7.2 LOG OF BORING FORM

A Log of Boring form will be prepared by the Field Scientist for each boring during the Geoprobe Soil Investigation. The form includes hydrologic conditions, lithologic descriptions using the Unified Soil Classification System, and information on the potential presence of contamination. A copy of the Log of Boring form is provided in Appendix D.

7.3 SOIL SAMPLE DATA FORM

A Soil Sample Data form will be used to record the soil condition observed and soil samples collected. The form will be completed by the Field Scientist at the time of sample collection. The forms will be maintained in the project files. A copy of the Soil Sample Data form is provided in Appendix D.

7.4 WASTE INVENTORY TRACKING SHEET

A Waste Inventory Tracking Sheet will be used to document and track wastes generated by the field investigation. The sheet will include information on the sample container, origin of the waste, type of waste, date generated, date removed from the Site, transporter, and disposal location. An example of the Waste Inventory Tracking Sheet is provided in Appendix D.

7.5 SAMPLE LABELS

Sample labels are filled out and affixed to corresponding containers immediately prior to sample collection. The label is completed in indelible ink and includes the medium, date, time sampled,

sample identification and number, project name, project number, sampler's initials, and analyte preservative(s), if any.

7.6 WASTE MATERIAL LABEL

The waste material label is filled out and affixed to the corresponding waste container immediately upon filling. The label is completed in indelible ink and includes the job number and name, address where the waste was generated, container contents, operation, date, consultant's name and phone number, and sampler's initials.

7.7 CHAIN OF CUSTODY

The written procedures that are followed whenever samples are collected, transferred, stored, analyzed, and/or destroyed are designed to create an accurate written record that can be used to trace the possession and handling of a sample from the moment of its collection through analysis and reporting of analytical values. This written record, the Chain of Custody form, will be filled out by the field sampling team at the time the sample is obtained.

All samples submitted to the laboratory are accompanied by a Chain of Custody form, which is checked for accuracy and completeness and then signed and dated by the laboratory sample custodian accepting the sample. At the laboratory, each sample is assigned a unique sequential laboratory identification number that is stamped or written on the Chain of Custody form.

All samples are held under internal chain of custody in the Sample Control room under the appropriate storage condition (e.g., ambient, refrigeration, frozen). The laboratory Project Manager assigned to the client is responsible for tracking the status of the samples throughout the laboratory. Samples are signed out of the Sample Control room in a sample control logbook by the analyst who will prepare the samples for analysis.

The Chain of Custody form includes the project name, sample identification number (assigned by the sampler in the field), sample date, sample location, and type of analysis required (if any). Whenever the sample is transferred from one party to another, both parties sign the Chain of Custody form and record the date and time of the transfer. In this manner, sample integrity is ensured from collection through analysis.

8.0 QUALITY ASSURANCE PROJECT PLAN

The Quality Assurance Project Plan presented in this section identifies the QA/QC protocols to be implemented in association with the Sampling and Analysis Plan for the Site. Specified in this section are the DQOs and the criteria for the sample collection and analysis to be conducted during implementation of the Work Plan to ensure that the DQOs are achieved. These criteria include sampling and analytical procedures, data management, QA/QC procedures, performance audits, data assessment, and corrective action procedures. Both quantitative and qualitative measures of data quality are included to ensure that the DQOs for implementation of the Work Plan are achieved.

8.1 RESPONSIBILITIES OF KEY PERSONNEL

The QA/QC responsibilities of the key personnel involved in Work Plan activities are described in the sections below.

8.1.1 Project Manager

Mr. Ryan Barth with Anchor is the designated Project Manager. The Project Manager has overall responsibility for developing the Work Plan, monitoring the quality of the technical and managerial aspects of the project, implementing the Work Plan as prescribed, and implementing corresponding corrective measures if necessary.

8.1.2 QA/QC Officers

Mss. Amy Essig Desai and Desiree Clement with Farallon are the designated QA/QC Officers. The QA/QC Officers have the responsibility to monitor the work and verify that it is being performed in accordance with the Work Plan and other supporting documents and standard procedures. The QA/QC Officers also have the responsibility to assess the effectiveness of the QA/QC program and to recommend modifications to the program, if applicable. The QA/QC Officers are responsible for ensuring that the personnel assigned to the project are trained relative to the requirements of the QA/QC program, and for reviewing and verifying the disposition of nonconformance and corrective action reports.

8.1.3 Project Staff

Members of the project staff are responsible for understanding and implementing the QA/QC program as it relates to the Geoprobe Soil Investigation objective and as established in the Jorgensen Forge Outfall Site planning documents.

8.1.4 Regulatory Agency

Mr. Mike Sibley is the EPA point of contact and control for matters concerning the Work Plan.

8.1.5 Document Control Clerk

The Document Control Clerks is Ms. Beth Roberts, Farallon Office Administrator, and Ms. Kate Nelson-Penland, Anchor QEA Project Coordinator. The Document Control Clerks will assist the Project Manager and QA/QC Officers in maintaining and organizing project files.

8.2 DATA QUALITY OBJECTIVES

The DQOs for this project are to develop and implement procedures to ensure that the data are of sufficient quality to accurately fulfill the Work Plan objective. Observations and measurements will be made and recorded in a manner to yield results representative of the media and conditions observed and/or measured. The quality of the analytical data will be assessed by precision, representativeness, completeness, and comparability. Definitions of these parameters and the applicable quality control procedures are described in sections 8.2.1 through 8.2.4 below. Quantitative DQOs for applicable parameters (i.e., precision, completeness) are provided following each definition.

8.2.1 Precision

Precision measures the reproducibility of measurements under a given set of conditions. Specifically, precision is a quantitative measure of the variability of two or more measurements compared to their average values. Precision is calculated from the results of duplicate sample analyses and is quantitatively expressed as the relative percent difference (RPD), calculated as follows:

$$RPD = \frac{(C_1 - C_2)}{(C_1 + C_2)/2} \times 100$$

Where:

 C_1 = the larger of the two duplicate results (i.e., the highest detected concentration); and

 C_2 = the smaller of the two duplicate results (i.e., the lowest detected concentration).

Quantitative RPD criteria for duplicate results have been developed by EPA for inorganic chemical analysis. The criterion is ± 35 percent for soil.

8.2.2 Representativeness

Representativeness is a qualitative measure of how closely the measured results reflect the actual concentration or distribution of the constituent concentrations in the matrix sampled. The sampling plan design, sampling collection techniques, sample handling protocols, sample analysis methods, and data review procedures have been developed to ensure that the results obtained are representative of Jorgensen Forge Outfall Site conditions.

8.2.3 Completeness

Completeness is defined as the percentage of measurements judged to be valid. Results will be considered valid if they are not rejected during data validation. Completeness is calculated as follows:

$$Completeness = \frac{(Number of \ Valid \ Measurements)}{(Total \ Number of \ Measurements)} \times 100$$

The target completeness goal for this work will be 90 percent for a given analysis.

8.2.4 Comparability

Comparability is a qualitative parameter expressing the confidence with which one data set can be compared with another. Use of standard EPA and Washington State Department of Ecology methods and procedures for both sample collection and sample analysis will make the data collected during the Geoprobe Soil Investigation comparable to other data generated.

8.3 CALIBRATION PROCEDURES

Procedures that will be used to calibrate the field equipment used during the field data collection phase of the Geoprobe Soil Investigation are provided in Appendix B, Standard Operating Procedures. All calibration protocols will be performed in accordance with manufacturer instructions. Calibration procedures will be modified if necessary to satisfy amendments to current regulations, methods, and/or guidelines.

8.4 SAMPLING PROCEDURES

Procedures that will be used to collect samples are described in Section 4, Sample Procedures, Designation, and Laboratory Analysis. The sampling protocols will be performed in accordance with generally accepted environmental practices and will meet or exceed current regulatory standards and guidelines. Sampling procedures may be modified if necessary to satisfy amendments to current regulations, methods, and/or guidelines.

8.5 ANALYTICAL PROCEDURES

Analyses to be conducted during the Geoprobe Soil Investigation are discussed in Section 4.3, Laboratory Analysis. The container types, hold times, analytical methods, practical quantitation limits, and method detection limits will be in accordance with current regulatory guidelines, and will be modified as necessary to satisfy amendments to current regulations, methods, and/or guidelines.

8.6 DATA MANAGEMENT, REDUCTION, REVIEW, AND REPORTING

This section outlines the procedures to be followed for the inventory, control, storage, and retrieval of data collected during implementation of the Work Plan. The procedures are designed to ensure that the integrity of the collected data is maintained for subsequent use. Moreover,

project tracking data (e.g., schedules, progress reports) will be maintained to monitor, manage, and document the progress of Work Plan implementation.

Anchor and Farallon will maintain the project files in accordance with the procedures outlined in the Work Plan. Data generated during field activities and by laboratory analyses will be submitted directly to Anchor. Documentation from the analytical laboratory will be maintained in Anchor's project file for purposes of validating analytical data collected during implementation of the Work Plan.

8.6.1 Data Types

A variety of data will be generated during implementation of the Work Plan, including sampling and analytical data and calculation results based on mathematical expressions. These data will be scrutinized and maintained in a manner consistent with the procedures described below and current and applicable regulatory requirements.

8.6.2 Data Transfer

Procedures controlling the receipt and distribution of incoming data packages to Anchor and Farallon and outgoing data and reports from Anchor and Farallon are outlined below.

8.6.2.1 Receipt of Data and Reports

Incoming documents will be date-stamped, and filed as follows:

- Correspondence and transmittal letters for reports, maps, and data will be filed chronologically.
- Data packages such as those from field personnel, contractors, and surveyors (e.g., survey data, geologic observations) will be filed by project number, subject heading, and date.

8.6.2.2 Outgoing Data and Reports

A transmittal sheet will be attached to outgoing project data and reports. A copy of each transmittal sheet will be kept in the project file. The Project Manager and QA/QC Officers will review outgoing correspondence, reports, maps, data, and other documentation. For distribution to multiple parties, the appropriate number of copies will be made and distributed. Original documents will not be distributed to project personnel.

8.6.3 Data Inventory

Procedures for the filing, storage, and retrieval of project data and reports are discussed below.

8.6.3.1 Document Filing and Storage

Project files and raw data files will be maintained at the Anchor and Farallon offices. Files will be organized chronologically by subject heading and maintained by the Document Control Clerk at Farallon.

8.6.3.2 Access to Project Files

Access to project files will be controlled by the Document Control Clerk and limited to the property owner, authorized representatives of the property owner, EPA, and Anchor and Farallon personnel. If a file is removed for use, a sign-out procedure will be used by the Document Control Clerk to track custody.

If a document is to be used for a long period, a copy of the document will be made, and the original will be returned to the project file.

8.6.4 Data Reduction and Analysis

The Project Manager and QA/QC Officers are responsible for data review and validation. The particular type of analyses and presentation method selected for any given data set will depend on the type, quantity, quality, and prospective use of the data. Analysis of project data is likely to require data reduction for preparation of tables, charts, and maps. To ensure that data are accurately transferred during the reduction process, the QA/QC Officers or designee (someone other than the person who prepared the map, table, or chart) will check the reduced data. Any incorrect transfer of data will be highlighted and corrected.

8.6.4.1 Data Reporting Formats

The physical and chemical characterization information developed during implementation of the Work Plan may be presented in the Phase 2 Geoprobe Soil Investigation Summary Report in the following formats:

- Summary Tables. Sampling and analysis data for soil will be sorted several ways, including by sample point number, constituent, and date of sample collection. The parameters chosen for sorting will depend on the determination of the most appropriate format and the utility of that format in demonstrating the physical and chemical characteristics of interest.
- Maps. Plan maps needed to illustrate results of the Geoprobe Soil Investigation will be assembled or prepared. The maps may include but are not limited to plan maps of the Jorgensen Forge Outfall Site showing chemical concentrations for individual chemicals and groups of chemicals.
- Cross-Sections. Vertical profiles (or cross-sections) may be generated from field data to display Jorgensen Forge Outfall Site stratigraphy or other aspects of the Geoprobe Soil Investigation.

8.6.5 Telephone Logs, Meeting Notes, and Field Notes

The Project Manager will maintain in the project file, notes from project meetings and telephone conversations. Throughout the field program, project field personnel will submit field notes to the Project Manager and the QA/QC Officers for review and filing in the project file.

8.7 QUALITY ASSURANCE/QUALITY CONTROL PROCEDURES

The QA/QC procedures for implementation of the Work Plan include the field and data quality control procedures described below.

8.7.1 Field Quality Control

Field quality control samples (e.g., field duplicate samples) to be collected for implementation of the Work Plan are described in Section 5.4.

8.7.2 Data Quality Control

Both analytical data and field data will undergo QA/QC evaluation by Anchor and Farallon. Analytical data will be validated at the Farallon office under supervision of the QA/QC Officers, as described in Section 8.6.4, Data Reduction and Analysis. The following types of quality control information will be reviewed, as appropriate:

- Method deviations;
- Method reporting limits;
- Duplicate samples (precision); and
- Percent completeness.

Anchor and Farallon will review field records and results of field observations and measurements to ensure that procedures were properly performed and documented. Included in the review of field procedures will be:

- Completeness and legibility of field logs and sampling forms;
- Preparation and frequency of field quality control samples; and
- Equipment calibration and maintenance.

8.8 PERFORMANCE AND SYSTEM AUDITS

Performance audits will be completed for both sampling and analysis work. Field performance will be monitored through regular review of field notebooks, sampling forms, and field duplicate sampling and analysis. The Project Manager and/or QA/QC Officers also may perform periodic on-site review of work in progress.

8.9 DATA ASSESSMENT PROCEDURES

The Project Manager and QA/QC Officers are responsible for data review and validation and preparation of a data validation report. Upon receipt of data from the analytical laboratory, calculations for precision, accuracy, and completeness will be performed using the equations presented in Section 8.2, Data Quality Objectives, and compared to DQO parameters.

8.10 CORRECTIVE ACTION

Corrective action will be the joint responsibility of the Project Manager and the QA/QC Officers. Corrective procedures may include:

- Identifying the source of a violation;
- Re-sampling and analyzing;

- Evaluating and amending sampling and analytical procedures; and/or
- Qualifying data to indicate the level of uncertainty.

During field sampling activities, the Project Manager, QA/QC Officers, and field team members will be responsible for identifying and correcting protocols that may compromise data quality. The Project Manager and/or QA/QC Officers will be contacted verbally for approval to proceed prior to implementation of a corrective action. All corrective action taken will be documented in the Field Report form.

9.0 DELIVERABLES AND SCHEDULE

This section discusses the summary report to be prepared following receipt of analytical data and information to be collected as part of the Work Plan. The anticipated schedule for the project also is discussed in this section.

9.1 SUMMARY REPORT

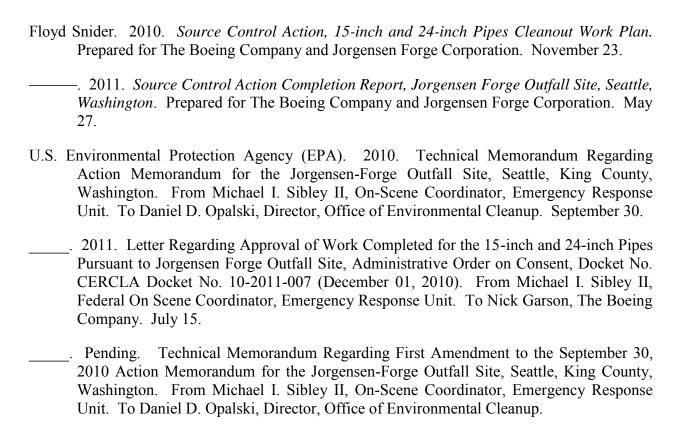
A Phase 2 Geoprobe Soil Investigation Summary Report will be prepared and submitted to EPA following implementation of the Work Plan and within 60 days of receipt of the final analytical data validation report. At a minimum, the Phase 2 Geoprobe Soil Summary Report will include:

- A brief description of the Jorgensen Forge Outfall Site;
- A discussion of the means and methods of the Work Plan investigation activities;
- A discussion of the subsurface conditions encountered during the Work Plan investigation activities;
- Scaled figures depicting the soil boring locations;
- Tables and figures summarizing soil laboratory analytical results, with comparison of any detected concentrations of hazardous substances with applicable screening levels; and
- Conclusions.

9.2 SCHEDULE

Implementation of the Work Plan will begin upon EPA approval of the scope of work. The field data collection phase of the Work Plan is anticipated to take approximately 5 days to complete. Subsequent laboratory analysis, including selection and additional analyses as needed, and data validation is anticipated to occur over a 45-day time frame. The Phase 2 Geoprobe Soil Investigation Summary Report will be prepared and submitted to EPA within 60 days of receipt of the final laboratory analytical data validation report.

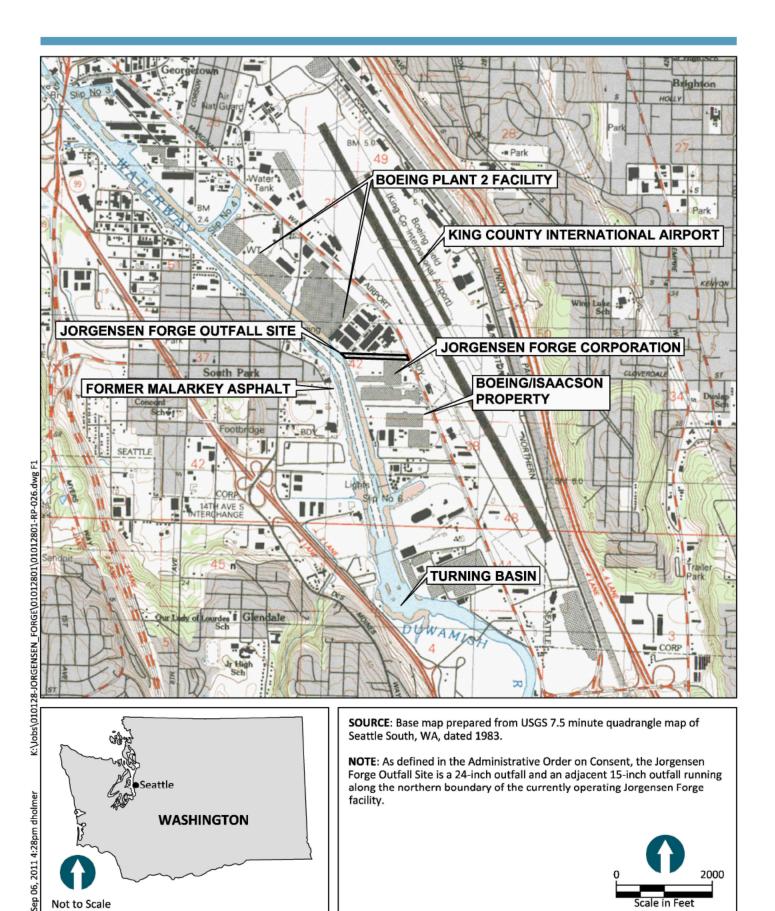
10.0 REFERENCES



FIGURES

PHASE 2 GEOPROBE SOIL INVESTIGATION WORK PLAN
Jorgensen Forge Outfall Site
CERCLA Docket No. 10-2011-0017
8531 East Marginal Way
Seattle, Washington

Farallon PN: 394-001

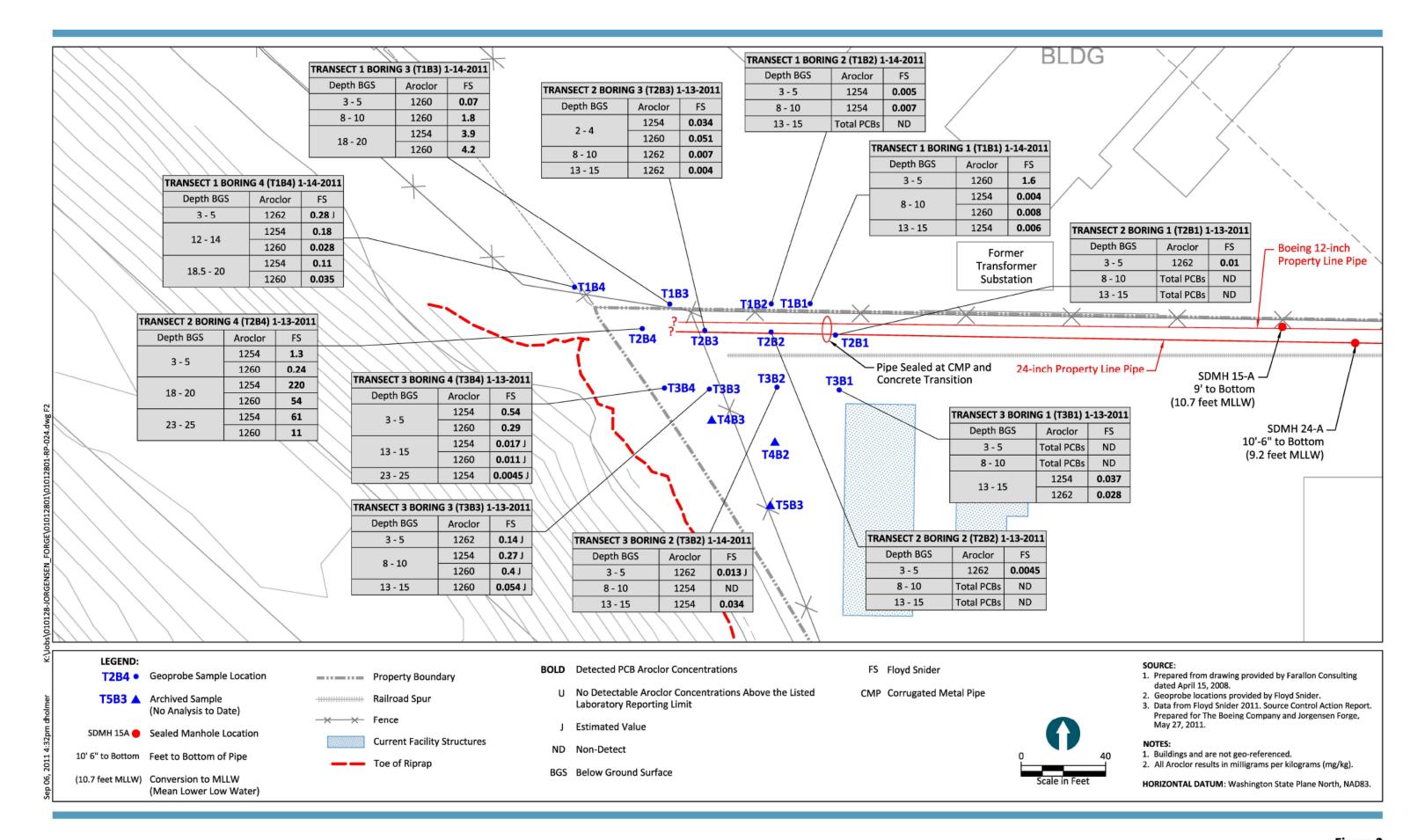




Not to Scale



Scale in Feet









TABLE

PHASE 2 GEOPROBE SOIL INVESTIGATION WORK PLAN
Jorgensen Forge Outfall Site
CERCLA Docket No. 10-2011-0017
8531 East Marginal Way
Seattle, Washington

Farallon PN: 394-001

Table 1

Container, Preservation, and Hold Time Requirements

Phase 2 Geoprobe Soil Investigation Work Plan

Jorgensen Forge Outfall Site Farallon PN: 394-001

				Minimum			
				Quantity	Preservation		
Analyte	Analytical Method	Media	Container	Needed	Requirements	Hold Time	Archival Requirements
PCBs (Aroclor)	EPA Method 8082	Soil	4-ounce glass jar	1	4°C	14 days to extract, 40 days to analyze	Freeze to -18°C

Notes:

PCBs = polychlorinated biphenyls

EPA = U S Environmental Protection Agency

°C = degrees Celsius

APPENDIX A HEALTH AND SAFETY PLAN

PHASE 2 GEOPROBE SOIL INVESTIGATION WORK PLAN
Jorgensen Forge Outfall Site
CERCLA Docket No. 10-2011-0017
8531 East Marginal Way
Seattle, Washington

Farallon PN: 394-001

HEALTH AND SAFETY PLAN

JORGENSEN FORGE OUTFALL SITE 8531 EAST MARGINAL WAY SOUTH SEATTLE, WASHINGTON

Submitted by:

Farallon Consulting, L.L.C. 975 5th Avenue Northwest Issaquah, Washington 98027

Farallon PN: 394-001

For:

Jorgensen Forge Corporation 8531 East Marginal way Tukwila, Washington 98108-4018

February 2012

HEALTH AND SAFETY PLAN REVIEW AND APPROVAL

Client: Jorgensen Forge Corporation	Facility Name: Jorgenser	n Forge Outfall Site
Project Name: Phase 2 Data Gaps Investigation	Project Number : <u>394-00</u>	1
Start Date: February 2012	End Date : May 2012	
Plan Expiration Date: August 2012 (Last day of ex	pected fieldwork or no longer than	a 6 months).
APPROVED BY:		
Desiree Clement Project Manager		
	Signature	Date
Richard McManus Office Health and Safety Coordinator		
	Signature	Date
Jon Peterson Site Health and Safety Officer		
·	Signature	Date
Amy Essig Desai Principal-in-Charge		
	Signature	Date

This Health and Safety Plan (HASP) was written for the use of Farallon Consulting, L.L.C. (Farallon) and its employees. It may be used also by trained and experienced Farallon subcontractors as a guidance document. However, Farallon does not guarantee the health or safety of any person entering this Site.

Due to the potentially hazardous nature of the site and the activities occurring thereon, it is not possible to discover, evaluate, or provide protection for all possible hazards that may be encountered. Strict adherence to the health and safety guidelines set forth herein will reduce, but does not eliminate, the potential for injury. The health and safety guidelines in this HASP were prepared specifically for this site, its conditions, purposes, dates of field work, and personnel, and must be amended if conditions change.

Farallon claims no responsibility for the use of this HASP by others. This HASP will provide useful information to subcontractors and will assist them in developing their own HASP, but it should not be construed as a substitute for their own HASP. Subcontractors should sign this HASP (see *Health and Safety Plan Acknowledgment and Agreement Form*, Attachment 1) as an acknowledgement of hazard information and as notice that this HASP does not satisfy their requirement to develop their own HASP.

CONTENTS

1.0	SCOPE OF WORK	1-1
2.0	BACKGROUND INFORMATION	2-1
3.0	DRUG AND ALCOHOL POLICY	3-1
4.0	WEAPONS POLICY	4-1
5.0	INCIDENT PREPAREDNESS AND RESPONSE 5.1 Health and Safety Preparedness 5.2 Injury or Illness 5.3 Reporting Procedures for Minor Cuts, Scratches, Bruises, etc. 5.4 Near Misses. 5.5 Medical Incidents Not Requiring Ambulance Service 5.6 Emergency Cases Requiring Ambulance Service. 5.7 Employee Death, or Hospitalization of Three or More employees 5.8 Response to Spills or Utility Breaches. 5.9 Notifications. 5.10 Shutoff valves and/or switches for utilities and products	5-1 5-2 5-2 5-2 5-3 5-4 5-4
6.0	EMERGENCY RESPONSE AND EVACUATION PLAN	
7.0	LOCAL EMERGENCY CONTACT NAMES AND TELEPHONE NUMBERS.	
8.0	PROJECT PERSONNEL AND RELEVANT INFORMATION	8-1
9.0	POTENTIAL AIRBORNE CONTAMINANTS	9-1
10.0	POTENTIAL SITE HAZARDS AND APPROPRIATE PRECAUTIONS	10-1
11.0	WASTE CHARACTERISTICS	
12.0	TRAFFIC CONTROL	12-1
	ATTACHMENTS	
Attacl	hment 1 Health and Safety Plan Acknowledgement and Agreement Form	
Attacl	hment 2 Directions to Hospital	
Attacl	hment 3 Potential Topics for Daily Health and Safety Meeting	
Attacl	hment 4 Daily Health and Safety Briefing Log	
Attacl	hment 5 Incident Report FOrm	
Attacl	hment 6 Near Miss Report Form	
Attacl	hment 7 Utility Clearance Logs	
Attacl	hment 8 Air Monitoring Table and Forms	

1.0 SCOPE OF WORK

This Health and Safety Plan (HASP) was prepared for the use of Farallon Consulting, L.L.C. (Farallon) personnel while performing the following tasks in accordance with the *Phase 2 Data Gaps Investigation Work Plan, Jorgensen Forge Outfall Site* prepared by Anchor QEA, LLC, dated February 2012 (Data Gaps Investigation):

• Task 1: Soil Borings.

The task will be conducted in a manner consistent with the methods and assumptions outlined in the above-referenced document.

2.0 BACKGROUND INFORMATION

The Site occupies approximately 20 acres at 8531 East Marginal Way South in Seattle, King County, Washington within the Duwamish River Valley on the east bank of the Lower Duwamish Waterway (LDW). The Site was developed in 1942 and has been operated by various entities as a steel fabricator and distributor since that time. Jorgensen Forge currently operates a steel and aluminum forge and mill that produce custom, high-precision steel and aluminum parts. The Site is developed with an approximately 124,000-square-foot industrial operations building, two office buildings, a laboratory, and several small storage outbuildings. The majority of the surfaces on the Site are covered with buildings, concrete, or asphalt. Stormwater on the Site is managed through an extensive stormwater conveyance system with discharges to both the Metro King County sewer system (Metro) and to the LDW through four permitted outfalls.

The purpose of the Data Gaps Investigation is to define the nature and extent of polychlorinated biphenyls (PCBs) subsurface soil concentrations in the vicinity of the T1B3 and T2B4 boring locations on The Boeing Company Plant 2 Facility (Boeing) and Jorgensen Forge Corporation (Jorgensen) properties. These borings were collected as part of the United States Environmental Protection Agency (USEPA) Administrative Order on Consent for Removal Action (Order; CERCLA Docket No. 10-2011-0017) Phase 1 actions to determine the nature of subsurface soils in the vicinity of the 15-inch¹ and 24-inch Property Line Storm Pipes (collectively, Pipes).

Investigation conducted at the T1B3 and T2B4 boring locations resulted in elevated total PCB concentrations in the subsurface soils. The USEPA Office of Emergency Response has been designated as the lead agency for ensuring that PCBs within these subsurface soils are not a source of contamination to the adjacent Lower Duwamish Waterway (LDW). The scope of work is to:

- Determine the lateral and vertical extent of soil containing concentrations of PCBs above 1 milligram per kilogram (mg/kg) in the vicinity of borings T1B3 and T2B4;
- Collect additional data (e.g., metals) to evaluate the extent of any removal action with respect to waste management/disposal suitability; and
- Evaluate association between debris fill in the vicinity of the outfalls and possible PCB occurrences.

3.0 DRUG AND ALCOHOL POLICY

It is Farallon's policy to maintain a drug-free workplace. Farallon has a responsibility to all of its staff members to provide a safe and inoffensive work environment, and a responsibility to its clients to provide accurate and consistent service. For these reasons, Farallon prohibits the following behavior by staff members in the field:

- Use of tobacco in any form by any person at any time in sensitive or hazardous areas that may pose a health and safety or environmental risk. The Site Health and Safety Officer (SHSO) may designate an area away from hazards that is safe for tobacco use;
- Possession or consumption of alcohol, or being under the influence of alcohol during field activities;
- Abuse of prescription and/or over-the-counter drugs in such a manner as to negatively impact performance or field safety; and
- Possession, use, sale, or being under the influence of illicit drugs while in the field or during any work hours.

Violation of any of the above codes of conduct is grounds for immediate removal from the project site and discipline in accordance with Farallon company policy. If an incident occurs as a result of an employee's actions, drug and alcohol testing will be performed in accordance with Farallon company policy.

4.0 WEAPONS POLICY

Farallon employees, contractors, subcontractors, and their employees working at the site are to ensure that they do not bring weapons onto the work site. Weapons include but are not limited to guns, knives, and explosives. Tools that are used during the course of field events, including but not limited to box knives, are exempt from this weapons policy. All vehicles and persons can be subjected to search while working at the property.

Failure to comply with the weapons policy can result in disciplinary action for the individual(s) involved in accordance with Farallon company policy.

5.0 INCIDENT PREPAREDNESS AND RESPONSE

Farallon employees and subcontractors working on the site must be prepared to respond appropriately to an incident involving injury, illness, death, spills, or utility breaches. This section outlines the degree of preparedness required for employees at a work site, and describes the actions to be taken in the event of a health and safety incident.

5.1 HEALTH AND SAFETY PREPAREDNESS

All individuals working at the site are required to be familiar with the contents of this HASP. In addition, the items on the following health and safety preparedness list should be reviewed prior to the commencement of work and during daily health and safety meetings:

- The directions to the hospital (provided in Attachment 2);
- The locations of first aid kits, personal eye washes, and fire extinguishers;
- The locations of the keys to site vehicles; and
- Hand sign language providing for the immediate stoppage of work (such as a horizontal hand movement in front of the neck).

Additional topics for daily health and safety meetings are included in Attachment 3, Potential Topics for Daily Health and Safety Meeting. Participation in daily health and safety meetings should be documented in the Daily Health and Safety Briefing Log (Attachment 4).

5.2 INJURY OR ILLNESS

If an injury or illness occurs, the following actions should be taken, regardless of the severity of the injury or illness:

- Stop work.
- Determine whether emergency response staff (e.g., fire, ambulance) are necessary. If so, dial 911 on a cell phone or the closest available telephone. Describe the location of the injured person and provide other details as requested. If an individual requires non-emergency medical care at a hospital, follow the directions to the nearest hospital, which are provided in Attachment 2. IF EMERGENCY MEDICAL CARE IS NEEDED CALL 911.
- Administer first aid to the individual immediately, using the first aid kit provided in the site vehicle. Use the bloodborne pathogens kit and personal eyewash, as needed.
- Notify the SHSO immediately. The SHSO is responsible for preparing and submitting an Incident Report form to Farallon's Health and Safety Coordinator (HSC) within 24 hours of the incident, and for notifying the employee's supervisor and the Principal in Charge. The Incident Report form is provided in Attachment 5.
- Notify Ron Myers at Jorgensen Forge of any emergency or safety issues: (206) 678-3116.

• All incidents must be reported to the HSC within 24 hours; however, the actual investigation need not be completed within 24 hours. A telephone message that includes the date, time, and general incident circumstances should be left at one of the following numbers if the HSC cannot be reached directly:

HSC work phone: (425) 295-0800HSC cell phone: (425) 466-1032

- If the HSC cannot be located contact the Principal-in-Charge.
- The SHSO will assume responsibility during a medical emergency until emergency response personnel arrive at the site.

5.3 REPORTING PROCEDURES FOR MINOR CUTS, SCRATCHES, BRUISES, ETC.

Every occupational illness or injury is to be reported immediately by the employee to the SHSO. The SHSO is to complete the Incident Report form provided in Attachment 5, and report the incident to the HSC.

5.4 NEAR MISSES

A near miss is defined as an incident in which no personal injury is sustained and no property damage is incurred, but where injury and/or property damage could have occurred under slightly different timing or location.

In the event of a near miss, the following actions are to be taken:

- Stop work.
- Report the near miss to an SHSO immediately.
- The SHSO is to report the near miss to the HSC and complete the Near Miss Report form in Attachment 6.
- Resume work upon satisfactory resolution of the near-miss condition and documentation of the corrective action(s) taken by the SHSO.

5.5 MEDICAL INCIDENTS NOT REQUIRING AMBULANCE SERVICE

Medical incidents not requiring ambulance services include injuries and conditions such as minor lacerations, and sprains. In the event of an injury, an illness, or a condition that does not require ambulance service, the following actions are to be taken:

- Stop work.
- Administer first aid as necessary to stabilize the individual for transport to the hospital.
- The SHSO is to facilitate prompt transportation of the individual to the hospital. Directions to the nearest hospital are provided in Attachment 2.

- A representative of Farallon or the subcontractor is to drive the individual to the medical facility and remain at the facility until the individual is able to return to the jobsite, or arrangements for further care have been established.
- If the driver is not familiar with the route to the hospital, a second person who is familiar with the route is to accompany the driver and the injured employee to the hospital.
- If it is necessary for the SHSO to accompany the injured employee to a medical facility, provisions must be made for another employee who is trained and certified in first aid to act as the temporary SHSO before work at the jobsite can resume.
- If the injured employee is able to return to the jobsite the same day, he/she is to bring a statement from the doctor that provides the following information:
 - Date of incident
 - Employee's name
 - Diagnosis
 - Date he/she is able to return to work, and whether regular or light duty
 - Date he/she is to return to the doctor for a follow-up appointment, if necessary
 - Signature and address of doctor
- The SHSO is to complete the Incident Report form provided in Attachment 5, and report the incident to the HSC.
- If the injured employee is unable to return to the jobsite the same day, the employee who transported him/her should bring the statement from the doctor back to the jobsite. The information on this statement should be reported to the HSC immediately.

5.6 EMERGENCY CASES REQUIRING AMBULANCE SERVICE

In the event of an injury or illness that requires emergency response and transport to a hospital by ambulance the following actions should be taken:

- **Dial 911** to request ambulance service.
- Notify the SHSO.
- Administer first aid until the ambulance service arrives.
- One designated company representative should accompany the injured employee to the medical facility and remain there until final diagnosis, treatment plan, and other relevant information has been obtained.
- The SHSO is to complete the Incident Report form provided in Attachment 5, and report the incident to the HSC immediately.

5.7 EMPLOYEE DEATH, OR HOSPITALIZATION OF THREE OR MORE EMPLOYEES

The procedures outlined in Section 6.2 should be followed in the event of an employee injury or illness. If an employee fatality occurs, the HSC, local emergency personnel and the coroner must be notified <u>immediately</u>. The HSC will initiate the required State of Washington Department of Labor and Industries and Occupational Safety and Health Administration (OSHA) notifications within 8 hours of a fatality or the hospitalization of three or more employees.

5.8 RESPONSE TO SPILLS OR UTILITY BREACHES

The location of underground utilities (e.g., product, sewer, telephone, fiber optic) and facilities (e.g., USTs, septic tanks, utility vaults) is to be noted prior to commencement of intrusive subsurface work activities. Use the public and private locate services as required and complete the Utility Clearance Log (Attachment 7). If a utility line or tank is breached or a spill or release occurs, the event is to be documented on the Incident Report form provided in Attachment 5 as soon as possible. The date, time, name of the person(s) involved, actions taken, and discussions with other affected parties are to be included. The SHSO, Project Manager (PM), and client are to be notified immediately. The PM is to notify the regulatory authority and/or utility company, as necessary.

In the event of a spill or release, the following actions should be taken:

- 1. Stay upwind of the spill or release.
- 2. Don appropriate personal protective equipment (PPE).
- 3. Turn off equipment and other sources of ignition.
- 4. Turn off pumps and shut valves to stop the flow or leak.
- 5. Plug the leak or collect drippings, when possible.
- 6. Use sorbent pads to collect the product and impede its flow, if possible.
- 7. Dial 911 or telephone the local fire department immediately if a fire or another emergency situation develops.
- 8. Inform the Farallon PM of the situation.
- 9. Determine whether the client would like Farallon to repair the damage or would rather use an emergency repair contractor.
- 10. Advise the client of spill discharge notification requirements, and establish who will complete and submit the required forms. *Do not report or submit information to an agency without the client's consent.* Document each interaction with the client and regulators, and note in writing names, titles, authorizations, refusals, decisions, and commitments to any action.

- 11. Do not transport or approve transportation of contaminated soils or product until proper manifests have been completed and approved. Be aware that soil and/or product may meet criteria for hazardous waste.
- 12. Do not sign manifests as a generator of wastes. Contact the PM to discuss waste transportation.

5.9 NOTIFICATIONS

A spill or release requires completion of an Incident Report form (provided in Attachment 5) per Farallon's Health and Safety program. The PM must involve the client and/or generator in the incident reporting process. The client and/or generator are under obligation to report the incident to the appropriate government agency(ies). If the spill extends into waterways, the Coast Guard and the National Response Center must be notified immediately by the client or with his permission (800 424-8802).

5.10 SHUTOFF VALVES AND/OR SWITCHES FOR UTILITIES AND PRODUCTS

Before starting work locate and list below the location of utility and product line shutoff valves and switches on the project site. Review the location of shutoff valves and switches with field personnel before beginning work.

The shutoff valves and/or switches for electrical, natural gas, gasoline, water lines, etc. are located:

Complete in the field before starting work.	

6.0 EMERGENCY RESPONSE AND EVACUATION PLAN

Farallon personnel and subcontractors working on site are to be aware of site-specific emergency and evacuation procedures, including alarm systems and evacuation plans and routes. If an incident occurs that requires emergency response, such as a fire or spill, **CALL 911 and request assistance**. Farallon staff, subcontractors, and/or others working in an area where an emergency occurs are to evacuate to a safe location away from the incident area, preferably upwind, and take attendance.

For this project the emergency evacuation gathering location is the parking lot located to the north of the Jorgensen Forge main entrance on the eastern property boundary.

If the emergency causes the route to be obstructed, Farallon personnel and subcontractors are to move to an open area upwind of the hazard area, and remain there until instructed by emergency response personnel (e.g., police, fire, ambulance personnel, paramedics) to do otherwise.

Subcontractors have the responsibility to account for their own employees and provide requested information to emergency response personnel immediately upon request. Farallon staff, subcontractors, and/or contractors may not reenter the scene of the emergency without specific approval from emergency response personnel.

7.0 LOCAL EMERGENCY CONTACT NAMES AND TELEPHONE NUMBERS

Local emergency response personnel can be contacted at the following numbers. Directions and a map to the hospital are included in Attachment 2.

	Location	Telephone No.
Hospital	Harborview Hospital 325 9 th Avenue South Seattle, Washington	911 or (206) 731-3000
Police	Seattle Police Department 3001 South Myrtle Street Seattle, Washington	911 or (206) 386-1850
Fire	Seattle Fire Department 12617 76 th Avenue South Seattle, Washington	911 or (206) 772-1430
Vessel Safety	U.S. Coast Guard	Emergency: (206) 217-6000 General Info: (206) 220-7000
Spill Response	EPA	(908) 321-6660
National Response Center		1-800-424-8802
Washington State Department of Ecology		(360) 407-6300
Poison Control		1-800-424-5555

8.0 PROJECT PERSONNEL AND RELEVANT INFORMATION

Questions about this project that are posed by neighbors, the press, or other interested parties should be directed to the Principal in Charge at Farallon: (425) 295-0800.

		Fi	ield Personnel	Fraining Date	es
Jorgensen Forge Outfall Site Project No. 394-001	General Project Responsibilities	40-Hour HAZWOPE R	8-Hour Refresher	CPR/ First Aid	Medical Surveillance Date
Site Health and Safety Officer Jon Peterson Office (425) 295-8000	Implement this HASP. Has authority to stop work. Perform air quality tasks. Take charge of all incidents. Review subcontractor's HASP.	5/18/2007	1/30/2012	11/2010	7/2009
Farallon Personnel Desiree Clement Office (425) 295-0800	Be familiar with HASP requirements and the Farallon Accident Prevention Program and Hazardous Waste Operations Program	5/18/2007	1/30/2012	11/2010	11/2009
Principal-in-Charge Amy Essig Desai Office (425) 295-0800 Cell: (b) (6)	Provide immediate support upon notice of any incident.	NA	NA	NA	NA
Health and Safety Coordinator Richard McManus Office (425) 295-0800 Cell: (b) (6)	Provide support in implementing HASP. Provide immediate support upon notice of any incident.	NA	NA	NA	NA
Client Contact Jerry Hill Office: 206-357-1060	Provide known analytical data from work performed by others. Provide notice of site hazards. Provide access to site. Provide information regarding available emergency supplies at the site.	NA	NA	NA	NA

9.0 POTENTIAL AIRBORNE CONTAMINANTS

The potential airborne contaminants of concern in the immediate vicinity at the site are listed in the table on the following page. The table should be reviewed, and any questions directed to the SHSO.

	POTENTIAL AIRBORNE CHEMICALS ON SITE FOR THIS PROJECT REVIEW THIS TABLE AND CONTACT THE SHSO WITH ANY QUESTION					
Chemical (or Class)	OSHA PEL ACGIH TLV	Other Pertinent Limits	Properties	Routes of Exposure or Irritation	Acute Health Effects	Chronic Health Effects/ Target Organs
Vinyl chloride	PEL - 1 ppm TLV - 1 ppm	NIOSH considers this material to be a carcinogen	Liquid with a pleasant odor at high concentrations	Inhalation; dermal; eye contact	Weakness; abdominal pain; pallor or cyanosis of extremities; liquid—frostbite	Gastrointestinal bleeding; enlarged liver; potential occupational liver carcinogen; damage to CNS, blood, respiratory system, lymphatic system
Trichloroethene (trichloroethylene)	PEL - 100 ppm TLV - 50 ppm	PEL Ceiling - 200 ppm NIOSH considers trichloroethylene to be a carcinogen	Colorless liquid (unless dyed blue) with a chloroform-like odor	Inhalation; dermal; ingestion; eye contact	Irritation to eyes, skin; headache; vertigo (an illusion of movement); visual disturbance; fatigue; giddiness; tremor; somnolence (sleepiness, unnatural drowsiness); nausea; vomiting; dermatitis	Cardiac arrhythmias; paresthesia; liver injury; potential occupational carcinogen of liver, kidney
Cis-1,2- dichloroethylene (cis- 1,2-DCE)	PEL – 200 ppm TLV – 200 ppm	NIOSH REL – 200 ppm	Colorless volatile liquid with ether-like, slightly acrid odor	Inhalation; dermal; ingestion; eye contact	Irritation to eyes; nausea; vomiting; weakness; tremor; cramps; vertigo	CNS depression, epigastric cramping; skin irritation and dermatitis
Trans-1,2- dichloroethylene (trans-1,2-DCE)	PEL – 200 ppm TLV – 200 ppm	NIOSH REL – 200 ppm	Colorless volatile liquid with ether-like, slightly acrid odor	Inhalation; dermal; ingestion; eye contact	Irritation to eyes; nausea; vomiting; weakness; tremor; cramps; vertigo	CNS depression, epigastric cramping; skin irritation and dermatitis
Polychlorinated biphenyls (PCBs)	PEL 0.5 - 1 mg/m ³ TLV 0.5 - 1 mg/m ³ , depending on the species	NIOSH REL - 0.001 mg/m ³ NIOSH considers this material to be a carcinogen IDLH - 5 mg/m ³	Pale or dark yellow odorless liquid	Inhalation; dermal; ingestion. Skin absorption is a significant mode of exposure.	Irritation to eyes, skin, respiratory tract; chloroacne	May cause reproductive, CNS, CVS, skin, eye or liver effects, cancer (leukemia)

NOTES:

ACGIH = American Conference of Governmental Industrial Hygienists

AIHA = American Industrial Hygiene Association

AIHA WEEL = AIHA-set workplace environmental exposure limits

C = ceiling limit

CNS = central nervous system

CVS = cardiovascular system

IDLH = immediately dangerous to life or health

mg/m³ = milligrams per cubic meter

NIOSH = National Institute for Occupation Safety and Health

OSHA = Occupation Safety and Health Administration

PEL = permissible exposure limit

ppm = parts per million

RBC = red blood cells

REL = recommended exposure limit set by National Institute for Occupational Safety and Health (NIOSH)

Skin = skin absorption

STEL = short-term exposure limit

TLV = threshold limit value set by ACGIH

TWA = time-weighted average

10.0 POTENTIAL SITE HAZARDS AND APPROPRIATE PRECAUTIONS

The following tables list potential hazards and appropriate precautions associated with planned field work:

10.1 ENVIRONMENTAL DRILLING

X1.C/	n In (t E) (mm)	D. (1111)	
Job Steps Clear drilling locations	Personal Protective Equipment (PPE) Reflective vest, steel-toed and -shank shoes, hard hat, safety glasses with side shields, and work gloves.	Potential Hazards Traffic hazards Overhead or underground installations Product releases Property damage Occupant inconvenience	 Critical Actions Refer to Utility Clearance Log (Attachment 7). Coordinate with Site Manger (or designee) to minimize potential conflicts. Review proposed locations against available construction drawings and known utilities, tanks, product lines, etc. Mark out the proposed borehole locations. Call underground utility locating service for public line location clearance and obtain a list of utilities being contacted. If necessary, coordinate private line locator for private property. Develop a traffic control plan with the client and local agencies, as applicable, which may include use of cones, barrier tape, jersey barriers, etc.
Mobilize with equipment/supplies suitable for drilling	Reflective vest, steel-toed and -shank shoes, hard hat, safety glasses with side shields, and work gloves.	Vehicle accident Lifting hazards Delay or improper performance of work due to improper equipment on site	 Begin each work day with tailgate safety meeting. Follow safe driving procedures. Employ safe lifting procedures. Verify that subcontractors are aware of their responsibilities for labor, equipment, and supplies. Review permit conditions.
Visually clear proposed drilling locations	Reflective vest, steel-toed and -shank shoes, hard hat, safety glasses with side shields, and work gloves.	Underground or overhead installations	Complete Utilities and Structures checklist on the Utility Clearance Log (provided in Attachment 7) and adjust drilling locations as necessary.
Set up necessary traffic control	Reflective vest, steel-toed and -shank shoes, hard hat, safety glasses with side shields, and work gloves.	Struck by vehicle during placement Vehicle accident resulting from improper placement of traffic control equipment	Use buddy system for implementing traffic control plan, such as setting out cones and tape to define the safety area.

Job Steps	Personal Protective Equipment (PPE)	Potential Hazards	Critical Actions
Assist with set up of rig	Reflective vest, steel-toed and -shank shoes, hard hat, safety glasses with side shields, and work gloves.	Vehicle accident during rig movement Damage caused by rig while accessing set-up location Contact with overhead installations Soft terrain Unexpected rig movement	 All staff should know the location of the kill switch for the drilling rig. Verify a clear pathway to the drilling location, and clearance for raising mast. Provide hand signals and guidance to the driver, as needed, to place rig. Visually inspect rig (fire extinguisher on board, no oil or other fluid leaks, cabling and associated equipment in good condition, pressurized hoses secured with whip-checks or adequate substitute, jacks in good condition). Use wooden blocks under jacks to spread load, if necessary. Chock wheels.
Set up exclusion zone(s) and work stations (drilling and logging and/or sample collection)	Reflective vest, steel-toed and -shank shoes, hard hat, safety glasses with side shields, and work gloves.	Struck by vehicle during setup Slip or fall hazards	Implement exclusion zone set-up. Set up work stations with clear walking paths to and from rig. Use safety tape and cone(s).
Clear upper 5 feet of drilling location using post-hole digger or hand auger	Reflective vest, steel-toed and -shank shoes, hard hat, safety glasses with side shields, ear plugs or ear muffs, work gloves. Respirator with organic vapor cartridges, chemical-resistant gloves, chemical-resistant apron as required.	Back strain Exposure to chemical hazards Hitting an underground utility Repetitive motion	 Keep full-face respirator with organic vapor cartridges readily accessible. Initiate air quality monitoring in accordance with the air monitoring protocol presented in Attachment 8. Stand upwind to avoid exposure whenever possible. Use the organic vapor monitor aggressively to track the airborne concentration of contaminants close to potential sources, such as the core when it is being raised from the hole, the core is opened, etc. Evaluate any soil samples inside a resealable plastic bag at arm's length. DO NOT EVALUATE THE SAMPLE IN THE OPEN, IN ORDER TO AVOID UNNECESSARY EXPOSURE. Use correct lifting techniques and tools. Complete the Pre-Drilling section of the Borehole Clearance Review form.

Job Steps	Personal Protective Equipment (PPE)	Potential Hazards	Critical Actions
Drilling	Reflective vest, steel-toed and -shank shoes, hard hat, safety glasses with side shields, ear plugs or ear muffs, work gloves. Respirator with organic vapor cartridges, chemical-resistant gloves, chemical-resistant apron as required.	Back strain Heat or cold Eye injury Noise Exposure to chemical hazards Breaching an underground utility Trip or fall Equipment failure	 Stand clear of operating equipment. Use correct lifting techniques. Monitor air quality in accordance with the air monitoring protocol presented in Attachment 8. Monitor drilling progress. Keep work area clear of tripping or slipping hazards. Perform periodic visual inspections of drill rig.
Collect samples in accordance with sampling plan	Reflective vest, steel-toed and -shank shoes, hard hat, safety glasses with side shields, ear plugs or ear muffs, work gloves. Respirator with organic vapor cartridges, chemical-resistant gloves, chemical-resistant apron as required.	Back strain Heat or cold Eye injury Noise Exposure to chemical hazards Breaching an underground utility Trip or fall Equipment failure	 Stand clear of operating equipment. Use correct lifting techniques. Monitor air quality in accordance with the air monitoring protocol presented in Attachment 8. Monitor drilling progress. Keep work area clear of tripping or slipping hazards. Perform periodic visual inspections of drill rig.
Manage cuttings	Reflective vest, steel-toed and -shank shoes, hard hat, safety glasses with side shields, ear plugs or ear muffs, work gloves. Respirator with organic vapor cartridges, chemical-resistant gloves, chemical-resistant apron as required.	Back strain Heat or cold Eye injury Noise Exposure to chemical hazards Breaching an underground utility Trip or fall Equipment failure	 Stand clear of operating equipment. Use correct lifting techniques. Monitor air quality in accordance with the air monitoring protocol presented in Attachment 8. Monitor drilling progress. Keep work area clear of tripping or slipping hazards. Perform periodic visual inspections of drill rig.

Job Steps	Personal Protective Equipment (PPE)	Potential Hazards	Critical Actions
Backfill borehole	Reflective vest, steel-toed and -shank shoes, hard hat, safety glasses with side shields, ear plugs or ear muffs, work gloves. Respirator with organic vapor cartridges, chemical-resistant gloves, chemical-resistant apron as required.	Back strain Trip hazards Eye injury from splashing or release of pressurized grout	 Mix grout to specification and completely fill the hole. Use proper lifting techniques. Keep work area clear of tripping hazards. Verify presence of and/or authorization by required grouting inspectors.
Develop well	Reflective vest, steel-toed and -shank shoes, hard hat, safety glasses with side shields, ear plugs or ear muffs, work gloves. Respirator with organic vapor cartridges, chemical-resistant gloves, chemical-resistant apron as required.	Physical injury from mechanical failure, drill rig, or air compressor Trip hazards. Exposure to contaminants Electric shock	 Verify that equipment is in good working order and that pressurized hoses are whip-checked. Keep full-face respirator with organic cartridges readily accessible. Keep work area orderly. Any generators must be equipped with GFCI circuit.
Gauge water levels and product thickness in wells, where applicable	Reflective vest, steel-toed and -shank shoes, hard hat, safety glasses with side shields, ear plugs or ear muffs, work gloves. Respirator with organic vapor cartridges, chemical-resistant gloves, chemical-resistant apron as required.	Back strain Inhalation or dermal exposure to chemical hazards Repetitive motion	 Have full-face respirator with organic cartridges readily accessible. Conduct air quality monitoring in accordance with the protocol presented in Attachment 8. Maintain a safe distance from the well head. Bend at knees rather than at the waist.
Purge well(s) and collect purge water	Reflective vest, steel-toed and -shank shoes, hard hat, safety glasses with side shields, ear plugs or ear muffs, work gloves. Respirator with organic vapor cartridges, chemical-resistant gloves, chemical-resistant apron as required.	Back strain Inhalation or dermal exposure to chemical hazards Slip or fall Contaminated water spill	 Use proper lifting techniques. Use PPE, and adhere to air monitoring guidelines as presented in Attachment 8. Keep work area clear of tripping or slipping hazards. Store purge water in appropriate containers.
Collect groundwater samples in accordance with sampling plan	Reflective vest, steel-toed and -shank shoes, hard hat, safety glasses with side shields, ear plugs or ear muffs, work gloves. Respirator with organic vapor cartridges, chemical-resistant gloves, chemical-resistant apron as required.	Cross-contamination Back strain Inhalation or dermal exposure to chemical hazards Slip or fall Improper labeling or storage of samples Injury from broken sample bottle (cuts or acid burns)	 Decontaminate sampling equipment between each well (unless disposable). Use proper lifting techniques. Have full-face respirator with organic cartridges within 3-5 feet of working location, and readily accessible. Label samples in accordance with sampling plan. Keep samples stored in appropriate containers, at correct temperature, and away from work area. Handle bottles carefully.

Job Steps	Personal Protective Equipment (PPE)	Potential Hazards	Critical Actions
Dispose of or store any purge water on site	Reflective vest, steel-toed and -shank shoes, hard hat, safety glasses with side shields, ear plugs or ear muffs, work gloves. Respirator with organic vapor cartridges, chemical-resistant gloves, chemical-resistant apron as required.	Back strain Exposure to contaminants	 Use suitable equipment to transport water (e.g., pumps, drum dollies). Have full-face respirator with organic cartridges within 3-5 feet of working location, and readily accessible. Label storage containers properly, and locate in an isolated area away from traffic and other site functions. Coordinate offsite disposal (where applicable).
Clean site; demobilize	Reflective vest, steel-toed and -shank shoes, hard hat, safety glasses with side shields, ear plugs or ear muffs, work gloves. Respirator with organic vapor cartridges, chemical-resistant gloves, chemical-resistant apron as required.	Traffic Lifting hazards	Use buddy system to remove traffic control, as necessary. Leave site clear of refuse and debris. Clearly mark or barricade any borings that need topping off or curing at a later time. Notify site personnel of departure, final well locations, and any cuttings and/or purge water left onsite. Use proper lifting techniques.
Package and deliver samples to laboratory		Back strain Traffic accidents	 Handle and pack bottles carefully (e.g., bubble wrap bags). Use proper lifting techniques. Apply safe driving practices.
Typical work	Steel-toed and -shank shoes, hard hat, safety glasses with side shields, hearing protection, reflective safety vest, leather gloves for non-chemical aspects of work Chemical-resistant gloves and apron if chemical exposure is suspected.	Weather-related incidents: automobile accidents, slips or falls	 Check weather reports daily. Project visits are not to be performed during inclement weather. Sampling may be performed during light rain mist. Wear raincoats. Drive at speed limit or less, as needed, to keep a safe distance from vehicle in front. Avoid short stops.
Typical work		Cold Stress	 For temperatures below 40°F, adequate insulating clothing must be worn. If the temperature is below 20°F, workers will be allowed to enter a heated shelter at regular intervals. Warm, sweet drinks should be available. Coffee intake should be limited. No one should begin work or return to work from a heated shelter with wet clothes. Workers should be aware of signs of cold stress, such as heavy shivering, pain in fingers or toes, drowsiness, or irritability. Onset of any of these signs is an indication that immediate return to a heated shelter is needed. Refer to ACGIH TLV Booklet for section on Cold Stress.

Job Steps	Personal Protective Equipment (PPE)	Potential Hazards	Critical Actions
Typical work		Heat Stress	 Discuss health effects and symptoms during daily health and safety meetings. Drink water regularly (at least one cup every 20-30 minutes, depending upon level of effort and the PPE worn). Refer to ACGIH TLV booklet for heat stress guidance, especially regarding PPE, type of work and frequency of breaks. Breaks should be taken in an area cooler than the work area. Monitor temperature and relative humidity using WBGT meter.
No eating, drinking, or smoking on site			
No contact lenses to be worn on site			
No facial hair that would interfere with respirator fit			
A safety meeting is to be held every day, even if only one person is working on the project on a given day.			Topics are to always include the work scheduled for the day and restatement of hazards and the means to avoid them. Other topics may include sampling in general, and advances in technology and how they may be applied to the project. Use the Daily Health and Safety Briefing Log in Attachment 4 to log the topics discussed.

11.0 WASTE CHARACTERISTICS

Waste anticipated to be generated on the project site:							
Type(s):	\(\) Liquid	\boxtimes Solid	Sludge	Other			
The approximate volume for each anticipated waste stream:							
Waste:	Liquid		Approximate	Volume:	55 gal	lons	
Waste:	Soil		Approximate	e Volume:	Five 5	5-gallon drun	ns
Characteristic	es:						
Corrosive	☐ Fl	ammable/Ignit	able	Radioacti	ve	Toxic	
Reactive	\Box U	nknown	\boxtimes Other (sp	ecify) Non-Haz	ardous		

12.0 TRAFFIC CONTROL

Work on this project site will be performed in areas of uncontrolled traffic access. Traffic control/warning devices will be placed around the work area to prevent undesirable interface between pedestrian and automotive traffic and project workers and equipment. These devices may include:

- Cones
- Tubular markers
- Barricades
- Temporary fencing
- Barricade tape

The traffic control/warning devices will be placed around the work in such a way that traffic access is inhibited (i.e. place cones less than 8-feet apart so cars cannot easily drive through work area without moving a cone). Barricade tape or temporary fencing will be used to inhibit access to the work area in locations where pedestrians will be encountered.

ATTACHMENT 1 HEALTH AND SAFETY PLAN ACKNOWLEDGEMENT AND AGREEMENT FORM

HEALTH AND SAFETY PLAN
Jorgensen Forge Outfall Site
8531 East Marginal Way South
Seattle, Washington

Farallon PN: 394-001

HEALTH AND SAFETY PLAN ACKNOWLEDGMENT AND AGREEMENT FORM

(All Farallon and subcontractor personnel must sign)

This Health and Safety Plan (HASP) has been developed for the purpose of informing Farallon employees of the hazards they are likely to encounter on the project site, and the precautions they should take to avoid those hazards. Subcontractors and other parties at the site must develop their own HASP to address the hazards faced by their own employees. Farallon will make a copy of this HASP available to subcontractors and other interested parties to fully disclose hazards we may be aware of, and to satisfy Farallon's responsibilities under the Occupational Safety and Health Administration (OSHA) Hazard Communication standard. Similarly, subcontractors and others on site are required to inform Farallon of any hazards they are aware of or that their work on site might possibly pose to Farallon employees, including but not limited to Material Safety Data Sheets for chemicals brought on site. This plan should NOT be understood by contractors to provide information pertaining to all of the hazards that a contractor's employees may be exposed to as a result of their work.

All parties conducting site activities are required to coordinate their activities and practices with the project Site Health and Safety Officer (SHSO). Your signature below affirms that you have read and understand the hazards discussed in this HASP, and that you understand that subcontractors and other parties working on site must develop their own HASP for their employees. Your signature also affirms that you understand that you could be prohibited by the SHSO or other Farallon personnel from working on this project for not complying with any aspect of this HASP.

Name	Title	Signature	Company	Date

ATTACHMENT 2 DIRECTIONS TO HOSPITAL

HEALTH AND SAFETY PLAN
Jorgensen Forge Outfall Site
8531 East Marginal Way South
Seattle, Washington

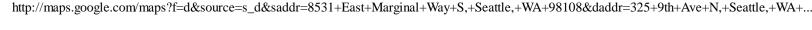
Farallon PN: 394-001



Directions to 325 9th Ave N, Seattle, WA 98109 7.8 mi – about 16 mins



(b)(4) copyright		



(b)(4) copyright		

Map data ©2012 Google

Directions weren't right? Please find your route on maps.google.com and click "Report a problem" at the bottom left.

ATTACHMENT 3 POTENTIAL TOPICS FOR DAILY HEALTH AND SAFETY MEETING

HEALTH AND SAFETY PLAN
Jorgensen Forge Outfall Site
8531 East Marginal Way South
Seattle, Washington

Farallon PN: 394-001

POTENTIAL TOPICS FOR DAILY HEALTH AND SAFETY MEETING

Emergency response plan, emergency vehicle (full of fuel) and muster point
Route to medical aid (hospital or other facility)
Work hours. Is night work planned?
Hand signals around heavy equipment
Traffic control
Pertinent legislation and regulations
Above- and below-ground utilities (energized or de-energized)
Material Safety Data Sheets
Reporting an incident: to whom, what, why, and when to report
Fire extinguisher and first aid kit locations
Excavations, trenching, sloping, and shoring
Personal protective equipment and training
Safety equipment and training
Emergency telephone location(s) and telephone numbers (in addition to 911)
Eye wash stations and washroom locations
Energy lock-out/tag-out procedures. Location of "kill switches," etc.
Weather restrictions
Site security. Site hazards. Is special waste present?
Traffic and people movement
Working around machinery (both static and mobile)
Sources of ignition, static electricity, etc.
Stings, bites, large animals, and other nature-related injuries and conditions
Working above grade
Working at isolated sites
Decontamination procedures (for both personnel and equipment)
How to prevent falls, trips, sprains, and lifting injuries
Right to refuse unsafe work
Adjacent property issues (e.g., residence, business, school, daycare center)

ATTACHMENT 4 DAILY HEALTH AND SAFETY BRIEFING LOG

HEALTH AND SAFETY PLAN
Jorgensen Forge Outfall Site
8531 East Marginal Way South
Seattle, Washington

Farallon PN: 394-001

DAILY HEALTH AND SAFETY BRIEFING LOG

Date	
Start Time	
Issues Discussed	
1.	
2.	
3.	
4.	
5.	
	ndees
Print Name	Signature
Meeting Conducted by	
Name (Site Health and Safety Coordinator)	Signature

ATTACHMENT 5 INCIDENT REPORT FORM

HEALTH AND SAFETY PLAN
Jorgensen Forge Outfall Site
8531 East Marginal Way South
Seattle, Washington

Farallon PN: 394-001

INCIDENT REPORT

NEAR MISS, ACCIDENTAL INJURY, OCCUPATIONAL ILLNESS, OR WORK PLACE INCIDENT

INCIDENT TYPE (TO BE COMPL	INCIDENT DA	ТЕ						
□ FATALITY □ INDUSTRIAL NON-RECORDABLE □ PRODUCT INTEGRITY □ CRIMINAL ACTIVITY □ LW RESTRICTED DUTY □ NON-INDUSTRIAL □ EQUIPMENT □ NOTICE OF VIOLATION □ OSHA MEDICAL OR ILLNESS WITHOUT LW □ MOTOR VEHICLE ACCIDENT □ FIRST AID □ FIRE This report must be completed by the employee or Health and Safety Coordinator immediately upon learning of the incident. The completed report must be review and signed by a Farallon Principal within 24 hours of the incident, even if employee is not available to review and sign. Employee or employee's doctor must subm copy of the doctor's report, and any subsequent exams, to Richard McManus at Farallon within 24 hours of the initial exam. After hours or weekends, telephone McManus via cell phone: (425) 466-1032. EMPLOYEE INFORMATION								
LAST NAME	FIRST NAME AND MIDDLE IN	ITIAL TITLE		DATE OF BIRTH				
EMPLOYMENT STATUS FULL-TIM	IE PART-TIME HOU	RLY-AS-NEEDED L	ENGTH OF EMPLOYMENT	<u></u> Γ				
DATE OF INJURY OR ONSET OF ILLNESS (MM/DD/YYYY) TIME OF EVENT OR EXPOSURE AM								
INJURY OR ILLNESS INFORM	IATION							
EXACT LOCATION OF INCIDENT (GEO	GRAPHICAL LOCATION, FLOOR,	BUILDING, ETC.)						
COUNTY	COUNTY ON EMPLOYER'S PREMISES? NO							
COMPLETE DESCRIPTION OF INCIDEN	T; INCLUDE SPECIFIC ACTIVITY	AT TIME OF INCIDENT	Γ (e.g., Lifting, Pushing, Walk	ing)				
DESCRIBE THE EQUIPMENT, MATERIALS, OR CHEMICALS THAT DIRECTLY HARMED THE EMPLOYEE (e.g., the machine that the employee struck or that struck the employee; the vapor inhaled; the material swallowed; what the employee was lifting or pulling)								
DESCRIBE THE SPECIFIC INJURY OR II	LLNESS (e.g., cut, strain, fracture, ski	n rash)						
BODY PART(S) AFFECTED (e.g., back, le	ft wrist, right eye)							
DATE EMPLOYER NOTIFIED		TO WHOM REPORT	ED					
MEDICAL PROVIDER INFORM	MATION (e.g., hospital, doct	or, clinic)						
NAME AND ADDRESS OF MEDICAL CA	ARE PROVIDER		TE	LEPHONE NO.				
TREATED IN EMERGENCY ROOM?	NO YES	HOSPITALIZED OVE	RNIGHT AS INPATIENT? [□ NO □ YES				

INCIDENT REPORT, CONTINUED

SEVERITY OF INJURY ILLNESS	OR		TIME LO (Check all tha		ply)	PHASI	E OF WOR	KDAY
☐ NO TREATMENT REQUIRED		□NC	TIME LOSS		☐ PERFORMING NORMAL WORK DUTIES			
☐ FIRST AID ONLY		□RE	TURN TO WORK TH	E NE	XT DAY	☐ MEAL PERI	OD	
☐ MEDICAL TREATMENT		□RE	STRICTED ACTIVITY	Y:		☐ REST PERIO	OD	
☐ FATALITY (ENTER DATE):	☐ FATALITY (ENTER DATE):					□ ENTERING/	LEAVING	
		F	RETURN DATE			☐ CHRONIC E	EXPOSURE	
	Ī	□LO	ST WORKDAY, NOT	AT V	WORK:	☐ OTHER (SP	ECIFY):	
		E	BEGIN DATE					
		F	RETURN DATE					
	•					1		
MOTOR VEHICLE ACCIDENT			PROFESSIONAL DRIVER?					
			YES NO					
TOTAL YEARS DRIVING	COMPA		EHICLE?	VEHICLE TYPE				
NO. OF VEHICLES TOWED		NO. O	F INJURIES NO. OF FATALITIES					
THIRD PARTY INCIDENTS								
NAME OF OWNER			ADDRESS				TELEPHONE I	NO.
DESCRIPTION OF DAMAGE			J					
INSURANCE INFORMATION								
WITNESS NAME			ADDRESS				PHONE NO.	
WITNESS NAME	ADDRESS				PHONE NO.			
REVIEWED BY							•	
NAME (PRINT)	SIGNA	ATURE		,	TITLE		DATE	

ATTACHMENT 6 NEAR MISS REPORT FORM

HEALTH AND SAFETY PLAN
Jorgensen Forge Outfall Site
8531 East Marginal Way South
Seattle, Washington

Farallon PN: 394-001

NEAR MISS REPORT

This report is to be filled out by any employee involved in or witnessing a near miss. A near miss is an incident that did not result in any personal injury, property damage, or work interruption. It is a very important indicator of potentially harmful future accident.

Project No	Project Name			
Project Address				
Date of incident:		Time:	_	☐ PM
Exact location of incident				
Description of incident or potent				
Corrective action taken				
		D .		
Employee Signature				
Printed Name				
Supervisor Signature		Date		
Printed Name				

ATTACHMENT 7 UTILITY CLEARANCE LOGS

HEALTH AND SAFETY PLAN
Jorgensen Forge Outfall Site
8531 East Marginal Way South
Seattle, Washington

Farallon PN: 394-001

TITILITY OF EADANCE LOC

Project:		ILITY CLE	_		UG : Number:	
Location:				•		
						on-directed excavation
	vation) or drilling op		ni stari incino	ci piio	i to any rarano	m-directed excavation
DRILLIN	G OR EXCAVA	ATION WORK	MAY NOT	PRC	CEED UNT	II. UTILITY
DRIEEN		ATES HAVE I				
	(See One-Call No					rm)
operations. Any drilli Owners of underground	ng or excavation within nd utilities are required	two feet of a marked ut by law to mark undergi	ility must be done ound facilities on	e with ha public a	nd tools. and private property	recting test pit excavation y. Owners of underground equired to subscribe to the
pipes) on private prop			nd other buried u	tilities (e	.g., on-site electric o	distribution lines, irrigation
Locate Check 1		uc.				
Map attached s	howing drilling o	or excavation sit	es and know	n util	ities	
Attach copy of	One-Call Utility	Notification Tic	cket (http://v	www.	searchandstat	us.com/)
One-Call Utilit	y Notification Ti	cket Number:				_
Attach copy of	Private Locate R	Receipt				
Photos taken of	f all excavation/d	Irilling locations	(Download	to pro	ject file)	
Facility Contac	t/Manager Appro	oval: Name		S	Signature	
Utilities and St	ructures					
Ту	ype	Utility Name	Public Utilities Marked	Utilit	Private ties/Laterals Marked	How Marked ¹
Petroleum pro	duct lines					
Natural gas lin	ne					
Water line						
Sewer line						
Storm drain					100	***************************************
Telephone cal	ole					
Electric power	r line					
Product tank						
Septic tank/dr	ain field					
Other	-					
¹ Flags, paint on payer	nent, wooden stakes, etc.					
Farallon Consu Field Team Lea	•				Date	
Electric RED	Gas-Oil-Steam YELLOW	Comm-CATV ORANGE	Water BLUE/PUR		Sewer GREEN	Temp Survey PINK

ONE-CALL UTILITY LOCATE REQUEST PROCEDURE THE ONE-CALL UTILITY LOCATE CENTER REQUIRES 48 HOURS TO MARK UTILITIES BEFORE YOU CAN DIG OR DRILL

In Washington Call 1-800-424-5555 In Oregon Call 1-800-332-2344

Washington state law requires that "before commencing <u>any</u> excavation" that the excavator or driller provide notice to all owners of underground utilities by use of the one-call locator service. Further, the law requires that the excavator/driller shall not dig/drill until all known utilities are marked. To fully comply with the law the following utility locate procedure is required:

- **1.** Call before you dig or drill Notify the One-Call Utility Notification Center (OCUNC) a minimum of two full business days before digging or drilling. Document your notification on a Utility Locate Telecon Form. Provide the following information (Bold indicates required information):
 - a. Your name, phone number, company name, mailing address, Farallon Account Number #25999
 - b. The name and phone number of an alternate contact person
 - c. If the work is taking place within 10 feet of any overhead power lines.
 - d. What type or work is being done.
 - e. Who the work is being done for.
 - f. The county and city the work is taking place in.
 - g. The address or the street where the work is taking place.
 - h. The nearest cross street.
 - i. The distance and direction of the worksite from the intersection.
 - j. Marking instructions, (specific instructions as to where the work is taking place).
 - k. Township, range, section, and quarter section of the worksite.
- **2. Record the utilities that will be notified** OCUNC will tell you what utilities are on or adjacent to the site based on their database. Record the name of the utility on the reverse side of this form.
- **3.** Confirm the utilities notified have marked the utilities in the field Before digging or drilling walk the site and confirm that the utilities that were notified marked the utilities in the field.
- **4.** If a locate appears to be missing If a utility locate appears to be missing, and the utility has not notified you that there are no utilities in the area, call OCUNC and:
 - a. Provide the OCUNC locate number
 - b. Clearly state which utility has not been marked. The call is being recorded.
 - c. Ask for a contact at that utility.
- **5.** Call contact(s) for missing utility(s) Call the contacts for missing utility locates and determine why no locate appears in field.
- **6.** Record reason(s) for missing locate(s) There may be reasons that locates do not appear in the field (e.g., no utilities are located on the site, utility has been abandoned).

Electric	Gas-Oil-Steam	Comm-CATV	Water	Sewer	Temp Survey
RED	YELLOW	ORANGE	BLUE/PURPLE	GREEN	PINK

Record the reason given. IF THEY ARE LATE – YOU WAIT TO DRILL OR DIG. If the utility failed to mark within the required two days they are liable for delay costs.

7. Hand dig within two feet – When digging or drilling within two feet of any marked utility the utility must be exposed <u>first</u> by using hand tools.

Electric	Gas-Oil-Steam	Comm-CATV	Water	Sewer	Temp Survey
RED	YELLOW	ORANGE	BLUE/PURPLE	GREEN	PINK

FARALLON CONSULTING, L.L.C.

FARALLON CONSULTING, L.L.C.	TELEPHONE CONVERSATION							
975 5 th Avenue Northwest	Date:Time: Project Name:							
Issaquah, Washington 98027								
78021	Job No:							
	· · · · · · · · · · · · · · · · · · ·							
	OR Prepared By/Initials:							
	Call: \Box Placed \Box Received							
Contact/Title:								
Agency/Region: One-Call Utility Notifica	ation Center							
PROJECT:								
1. Your name and the Farallon Account N	Number #25999							
2. What is the type of work being conduct	ted? (Environmental drilling, test pit excavation)							
3. Who is the property owner?								
4. County and city were work is being dor	ne?							
5. Address or street where work is taking	place?							
6. Nearest cross street?								
7. Distance and direction of the worksite from	m the intersection?							
8. Marking Instructions (Generally lo	cate on entire site including rights-of-way and							
easements):								
9. What time and date will the locate be con	npleted?							
10. Utility Locate Request Number?								
11. Utilities that will be notified?								
12. Any Overhead Concerns? No								
cc:	of							

Note: Bold indicates required information

ATTACHMENT 8 AIR MONITORING TABLE AND FORMS

HEALTH AND SAFETY PLAN
Jorgensen Forge Outfall Site
8531 East Marginal Way South
Seattle, Washington

Farallon PN: 394-001

ACTION LEVEL TABLE FOR AIR MONITORING

The Air Monitoring table (following page) presents protocol for monitoring ambient air for constituents of concern and other parameters that may affect worker safety. Please note the following with respect to use of this table:

- The Level for Respirator Use indicates the concentration at which a respirator must be donned. It does not require that the job stop. The respirator is a piece of equipment that is to be used while determining why a concentration has reached that level. Implement engineering controls such as water mist, spray foam, plastic cover, etc. to reduce the concentration.
- The Level for Work Stoppage indicates the concentration at which work on the job must stop. Determine why a concentration has reached that level, and how it can be decreased. Site evacuation is not necessary at this level. Stopping work does not imply that the concentration level will decrease. Implement engineering controls to reduce the concentration; resume work when it is safe to do so.
- These values can be modified under particular site conditions and with specific knowledge of the contaminant(s). Should such conditions arise, contact Farallon's Health and Safety Officer, Richard McManus at (425) 295-0800.

AIR MONITORING

Chemical (or Class)	Monitoring Equipment	Task	Monitoring Frequency and Location	Level for Respirator Use	Level for Work Stoppage
Volatile Organic Vapors	Flame ionization detector (FID)/ photoionization detector (PID) as appropriate for chemicals of concern. Read manual to determine. Draeger Tube for vinyl chloride (Model 1/a; Part Number 67 28031). Draeger Tube for benzene (Model 0.5/a).	From start of mobilization to completion and demobilization.	Sampling should be continuous during the project while disturbing potentially contaminated soil, uncovering and/or removing tanks and piping, or drilling —at least every 15 minutes in the breathing zone. Sample at the exclusion zone boundaries every 30 minutes. Continuously sample during each soil and groundwater sampling interval. If 10 parts per million (ppm) in breathing zone, collect a Draeger Tube for benzene and/or vinyl chloride (depending upon contaminants of concern).	20 ppm above background sustained in breathing zone for 2 minutes, and no benzene and/or vinyl chloride tube discoloration. If a color change appears on the tube for benzene or vinyl chloride at 10 ppm on FID/PID, don respirator. If no Draeger Tube is available, the level for respirator use is to be 5 ppm.	50 ppm above background in breathing zone and no vinyl chloride or benzene tube discoloration. Stop work if tube indicates > 1 ppm for benzene or vinyl chloride. If no Draeger Tube is available, stop work at 25 ppm.

AIR MONITORING EQUIPMENT CALIBRATION/CHECK LOG

Date	Instrument/ Model No.	Serial No.	Battery Check OK?	Zero Adjust OK?	Calibration Gas (ppm)	Reading (ppm)	Leak Check	Performed By	Comments
									_

AIR MONITORING LOG

Date	Time	Location	Source/Area/ Breathing Zone	Instrument	Concentration/Units	Sampled by



APPENDIX B TABLES 3 THROUGH 6 FROM MAY 27, 2011 FLOYD SNIDER SOURCE CONTROL ACTION COMPLETION REPORT

PHASE 2 GEOPROBE SOIL INVESTIGATION WORK PLAN
Jorgensen Forge Outfall Site
CERCLA Docket No. 10-2011-0017
8531 East Marginal Way
Seattle, Washington

Farallon PN: 394-001

Table 3
CMP Investigation Geoprobe Soil Analytical Results—Detected Compounds
Transect 1¹

	Location	T1B1	T1B1	T1B1	T1B2	T1B2	T1B2	T1B2	T1B3	T1B3	T1B3	T1B4	T1B4	T1B4
	Sample ID	JF-T1B1-SO-03	JF-T1B1-SO-08	JF-T1B1-SO-13	JF-T1B2-SO-03	JF-T1B2-SO-03-D ²	JF-T1B2-SO-08	JF-T1B2-SO-13	JF-T1B3-SO-03	JF-T1B3-SO-08	JF-T1B3-SO-18	JF-T1B4-SO-03	JF-T1B4-SO-12	JF-T1B4-SO-18
Sa	mple Date	01/14/2011	01/14/2011	01/14/2011	01/14/2011	01/14/2011	01/14/2011	01/14/2011	01/14/2011	01/14/2011	01/14/2011	01/14/2011	01/14/2011	01/14/2011
Sample Dep	th (ft bgs)	3-5 ft	8–10 ft	13-15 ft	3-5 ft	3–5 ft	8–10 ft	13-15 ft	3–5 ft	8–10 ft	18-20 ft	3–5 ft	12-14 ft	18-20 ft
Parameter	Units													
Metals														
Arsenic	mg/kg	7	7 U	7 U	6 U	6 U	6 U	7 U	5 U	6	12	120 U	6 U	6 U
Cadmium	mg/kg	0.4	0.3 U	0.3	0.2 U	0.2 U	0.2 U	0.3 U	0.3	1.1	38.2	87	0.8	0.2 U
Copper	mg/kg	3830	21.2	16.9	17.5	14.5	17.6	18.2	45.7	70.5	257	55900	59.4	9.5
Lead	mg/kg	24	3 U	3 U	4	4	3	3 U	7	11	1330	2850	11	5
Nickel	mg/kg	25	11	14	15 J	9 J	13	13	20	25	53	2160	22	8
Zinc	mg/kg	68	25	245	28	28	29	26	53	126	2720	5270	83	57
Total Petroleum Hydrocart														
Diesel Range Hydrocarbons	mg/kg	6.7 J	6.6 U	6.7 U	6 U	5.6 U	6.4 U	6.6 U	5.2 U	11 J	91	130 J	15 J	6.4 U
Mineral Oil	mg/kg	22	13 U	13 U	12 U	11 U	13 U	13 U	10 U	57	150	470	40	13 U
Motor Oil	mg/kg	25	13 U	13 U	12 U	11 U	13 U	13 U	10 U	65	170	540	46	13 U
Polychlorinated Biphenyls	3													
Aroclor 1242	μg/kg	55 U	4 U	3.9 U	4 U	3.9 U	3.9 U	3.9 U	3.9 U	41 U	310 U	7.2 UJ	5 U	5.1 U
Aroclor 1248	μg/kg	55 U	4 U	3.9 U	4 U	3.9 U	3.9 U	3.9 U	3.9 U	100 UY	1200 UY	25 UJ	50 UY	38 UY
Aroclor 1254	μg/kg	550 UY	4.2	5.6	5.1	4.9	7	3.9 U	30 UY	810 UY	3900	36 UJ	180	110
Aroclor 1260	μg/kg	1600	7.8	3.9 U	4 U	3.9 U	3.9 U	3.9 U	70	1800	4200	7.2 UJ	28	35
Aroclor 1262	μg/kg	55 U	4 U	3.9 U	4 U	3.9 U	3.9 U	3.9 U	3.9 U	41 U	310 U	280 J	5.1 U	5.1 U
Total PCBs	μg/kg	1600	12	5.6	5.1	4.9	7	3.9 U	70	1800	8100	280 J	208	145
Semivolatile Organic Com	pounds					<u> </u>								
bis(2-Ethylhexyl)phthalate	μg/kg	61 U	61 U	63 U	59 U	59 U	63 U	60 U	65 U	62 U	1500	61 U	57 U	63 U
Di-n-Butylphthalate	μg/kg	61 U	61 U	63 U	59 U	59 U	63 U	60 U	65 U	62 U	1100	61 U	57 U	63 U

Notes:

- 1 Data qualifiers assigned independently by Informa LLC.
- 2 Duplicate sample.
- 3 Only results for Aroclors 1242 through 1262 are shown. Other aroclors were analyzed, but were not detected.

Abbreviations:

bgs Below ground surface

ft Feet

mg/kg Milligram per kilogram

µg/kg Microgram per kilogram

Qualifiers:

- J Estimated value
- U Not detected
- UJ Not detected, estimated detection limit
- UY Not detected, used for complex mixtures that overlap

FLOYD | SNIDER

Jorgensen Forge Outfall Site

Table 4
CMP Investigation Geoprobe Soil Analytical Results—Detected Compounds
Transect 2¹

	Location	T2B1	T2B1	T2B1	T2B2	T2B2	T2B2	T2B3	T2B3	T2B3	T2B4	T2B4	T2B4
	Sample ID	JF-T2B1-SO-03	JF-T2B1-SO-08	JF-T2B1-SO-13	JF-T2B2-SO-03	JF-T2B2-SO-08	JF-T2B2-SO-13	JF-T2B3-SO-02	JF-T2B3-SO-08	JF-T2B3-SO-13	JF-T2B4-SO-03	JF-T2B4-SO-18	JF-T2B4-SO-23
Sa	ample Date	01/13/2011	01/13/2011	01/13/2011	01/13/2011	01/13/2011	01/13/2011	01/13/2011	01/13/2011	01/13/2011	01/13/2011	01/13/2011	01/13/2011
Sample Depth (ft bgs)		3–5 ft	8–10 ft	13-15 ft	3–5 ft	8–10 ft	13–15 ft	2-4 ft	8–10 ft	13–15 ft	3–5 ft	18-20 ft	23-25 ft
Parameter	Units												
Metals													
Arsenic	mg/kg	6 U	6	7 U	19	7	6 U	8	8	7	8	14	180
Cadmium	mg/kg	0.4	0.2 U	0.4	0.3	0.3	0.3 U	0.4	0.3	0.3	0.8	29.4	2.1
Copper	mg/kg	17.4	20.9	20.5	44.5	25.7	17	37.8	43.3	30.6	48.2	688	209
Lead	mg/kg	8	6	3 U	36	46	5	22	31	30	87	886	300
Nickel	mg/kg	18	13	18	10	10	13	18	11	11	24	202	34
Zinc	mg/kg	42	36	35	67	79	695	119	59	60	225	5630	1520
Total Petroleum Hydrocarbo		00	0.011	40.1	0.4	070	0.5.11	70.1	0.0.1	440	40.1	0.400	040
Diesel Range Hydrocarbons	mg/kg	20	6.2 U	16 J	21	270	6.5 U	7.8 J	8.2 J	110	42 J	2400	310
Mineral Oil	mg/kg	53	12 U	48	42	520	13 U	200 220	22	110	500	3900	1100
Motor Oil	mg/kg	58	12 U	52	46	570	13 U	220	25	120	550	4300	1200
Polychlorinated Biphenyls ²						1	1			·		T	
Aroclor 1242	μg/kg	4 U	3.9 U	3.9 U	3.9 U	3.9 U	4 U	7.9 U	3.9 U	3.9 U	150 U	12000 U	3900 U
Aroclor 1248	μg/kg	4 U	3.9 U	3.9 U	3.9 U	3.9 U	4 U	7.9 U	3.9 U	3.9 U	440 UY	120000 UY	29000 UY
Aroclor 1254	μg/kg	4 U	3.9 U	3.9 U	3.9 U	3.9 U	4 U	34	3.9 U	3.9 U	1300	220000	61000
Aroclor 1260	μg/kg	4 U	3.9 U	3.9 U	3.9 U	4.9 UY	4 U	51	3.9 U	3.9 U	240	54000	11000
Aroclor 1262 Total PCBs	μg/kg	9.8	3.9 U	3.9 U	4.5	3.9 U	4 U	7.9 U	6.7	4	150 U	12000 U	3900 U
	μg/kg	9.8	3.9 U	3.9 U	4.5	4.9 UY	4 U	85	6.7	4	1540	274000	72000
Low Molecular Weight Polyc			COLL	62 U	C4 11	C2 11	CELL	64 U	CO 11	CE II	COLL	120	780
Naphthalene Acenaphthene	μg/kg	66 U 66 U	62 U 62 U	62 U	61 U	63 U	65 U 65 U	64 U	60 U	65 U 65 U	63 U	130 120 U	94
Fluorene	μg/kg μg/kg	66 U	62 U	62 U	61 U 73	63 U 63 J	65 U	64 U	60 U 60 U	65 U	63 U 63 U	120 U	62 U
Phenanthrene	μg/kg μg/kg	66 U	62 U	62 U	630	84	65 U	64 U	60 U	65 U	63 U	120 U	130
Anthracene	μg/kg μg/kg	66 U	62 U	62 U	120	63 U	65 U	64 U	60 U	65 U	63 U	120 U	62 U
2-Methylnaphthalene	μg/kg μg/kg	66 U	62 U	62 U	61 U	63 U	65 U	64 U	60 U	65 U	63 U	120 U	150
High Molecular Weight Polyc				02 0	010	00 0	00 0	0+ 0	00 0	00 0	00 0	120 0	100
Fluoranthene	μg/kg	66 U	62 U	62 U	610 J	150 J	65 U	64 U	61 J	73 J	63 U	120 U	62 U
Pyrene	µg/kg	66 U	62 U	62 U	600	160	65 U	64 U	72	82	63 U	120 U	74
Benzo(a)anthracene	μg/kg	66 U	62 U	62 U	260	230	65 U	64 U	60 U	65 U	63 U	120 U	62 U
Chrysene	μg/kg	66 U	62 U	62 U	270	300	65 U	64 U	60 U	65 U	81 J	120 U	62 U
Total Benzofluoranthenes	μg/kg	66 U	62 U	62 U	380	600	65 U	64 U	81	67	63 U	120 U	62 U
Benzo(a)pyrene	μg/kg	66 U	62 U	62 U	260	730	65 U	64 U	60 U	65 U	63 U	120 U	62 U
Indeno(1,2,3-cd)pyrene	μg/kg	66 U	62 U	62 U	89	240	65 U	64 U	60 U	65 U	63 U	120 U	62 U
Dibenz(a,h)anthracene	μg/kg	66 U	62 U	62 U	61 U	420	65 U	64 U	60 U	65 U	63 U	120 U	62 U
Benzo(g,h,i)perylene	μg/kg	66 U	62 U	62 U	86	490	65 U	64 U	60 U	65 U	63 U	120 U	62 U
Semivolatile Organic Compo	unds												
1,2-Dichlorobenzene	μg/kg	66 U	62 U	62 U	61 U	63 U	65 U	64 U	60 U	65 U	63 U	270	62 U
1,4-Dichlorobenzene	μg/kg	66 U	62 U	62 U	61 U	63 U	65 U	64 U	60 U	65 U	63 U	150	62 U
1-Methylnaphthalene	μg/kg	66 U	62 U	62 U	61 U	63 U	65 U	64 U	60 U	65 U	63 U	120 U	74
2,4-Dinitrotoluene	μg/kg	330 U	310 U	310 U	300 U	310 J	330 U	320 U	300 U	320 U	310 U	610 U	310 U
4,6-Dinitro-2-Methylphenol	μg/kg	660 U	620 U	620 U	610 U	630 J	650 U	640 U	600 U	650 U	630 U	1200 U	620 U
4-Bromophenyl-phenylether	μg/kg	66 U	62 U	62 U	61 U	63 J	65 U	64 U	60 U	65 U	63 U	120 U	62 U
4-Chlorophenyl-phenylether	μg/kg	66 U	62 U	62 U	61 U	63 J	65 U	64 U	60 U	65 U	63 U	120 U	62 U
4-Nitrophenol	μg/kg	330 U	310 U	310 U	300 U	310 J	330 U	320 U	300 U	320 U	310 U	610 U	310 U
bis(2-Ethylhexyl)phthalate	μg/kg	66 U	62 U	62 U	61 U	63 U	65 U	64 U	60 U	65 U	63 U	16000	820
Di-n-Butylphthalate	μg/kg	66 U	62 U	62 U	61 U	63 U	65 U	64 U	60 U	65 U	65	2100	190
Hexachlorobenzene	μg/kg	66 U	62 U	62 U	61 U	63 J	65 U	64 U	60 U	65 U	63 U	120 U	62 U

Page 1 of 1

Notes:

- 1 Data qualifiers assigned independently by Informa LLC.
- 2 Only results for Aroclors 1242 through 1262 are shown. Other aroclors were analyzed, but were not detected.

Abbreviations:

Qualifiers:

bgs Below ground surface

ft Feet

mg/kg Milligram per kilogram

U Not detected
UJ Not detected, estimated detection limit

UY Not detected, used for complex mixtures that overlap

J Estimated value

Table 5
CMP Investigation Geoprobe Soil Analytical Results—Detected Compounds
Transect 3¹

	Location	T3B1	T3B1	T3B1	T3B2	T3B2	T3B2	T3B2	T3B3	T3B3	T3B3	T3B4	T3B4	T3B4
	Sample ID	JF-T3B1-SO-03	JF-T3B1-SO-08	JF-T3B1-SO-13	JF-T3B2-SO-03	JF-T3B2-SO-08	JF-T3B2-SO-13	JF-T3B2-SO-13-D ²	JF-T3B3-SO-03	JF-T3B3-SO-08	JF-T3B3-SO-13	JF-T3B4-SO-03	JF-T3B4-SO-13	JF-T3B4-SO-23
s	Sample Date	01/13/2011	01/13/2011	01/13/2011	01/13/2011	01/13/2011	01/13/2011	01/13/2011	01/13/2011	01/13/2011	01/13/2011	01/13/2011	01/13/2011	01/13/2011
	epth (ft bgs)	3-5 ft	8–10 ft	13-15 ft	3-5 ft	8–10 ft	13-15 ft	13-15 ft	3-5 ft	8–10 ft	13-15 ft	3-5 ft	13-15 ft	23-25 ft
Parameter	Units													
Metals	Metals													
Arsenic	mg/kg	6 U	6 U	7	5 U	6 U	6 U	6 U	6 U	20 U	6 U	10 U	7	6 U
Cadmium	mg/kg	0.2 U	0.2 U	0.3 U	0.2 U	0.3 U	0.3 U	0.2 U	2.1	6.5	0.5	6.9	0.2 U	0.2 U
Copper	mg/kg	15.4	14.7	29.2	16.3	22	24.9	25.1	62.6 J	354	38.8	111	51.8	10.5
Lead	mg/kg	2 U	2	3	7	3	3	3	27	208	24	259	7	2 U
Nickel	mg/kg	9	11	16	16	13	14	14	60	151	19	160	29	10
Zinc	mg/kg	26	34	37	42	31	37	39	116 J	6960	525	4720	142	29
Total Petroleum Hydrocarb														
Diesel Range Hydrocarbons	mg/kg	6.5 U	6.1 U	220	9.3 J	6.6 U	6.8 U	6.7 U	9.4 J	46	7.7 J	42	59 J	7 U
Mineral Oil	mg/kg	13 U	12 U	540	33	13 U	14 U	14 U	36	190	28	350	2400	14 U
Motor Oil	mg/kg	13 U	12 U	600	36	13 U	14 U	14 U	40	200	31	380	2600	14 U
Polychlorinated Biphenyls ³	3													
Aroclor 1242	μg/kg	3.9 U	3.9 U	8.5 U	3.8 U	3.9 U	6.6 U	8.4 U	8.5 UJ	20 UJ	8.8 U	13 U	3.8 U	3.9 U
Aroclor 1248	μg/kg	3.9 U	3.9 U	17 UY	3.8 U	3.9 U	17 UY	21 UY	8.5 UJ	79 UJ	8.8 U	170 UY	3.8 U	3.9 U
Aroclor 1254	μg/kg	3.9 U	3.9 U	37	3.8 U	3.9 U	34	54	13 UJ	270 J	22 UY	540	17 J	4.5 J
Aroclor 1260	μg/kg	3.9 U	3.9 U	8.5 U	3.8 U	3.9 U	6.6 U	8.4 U	8.5 UJ	400 J	54 J	290	11 J	3.9 U
Aroclor 1262	μg/kg	3.9 U	3.9 U	28	13 J	3.9 U	6.6 U	8.4 U	140 J	20 UJ	8.8 U	13 U	3.8 U	3.9 U
Total PCBs	μg/kg	3.9 U	3.9 U	65	13 J	3.9 U	34	54	140 J	670 J	54 J	830	28 J	4.5 J
Low Molecular Weight Poly	ycyclic Arom	atic Hydrocarbons	3											
Phenanthrene	μg/kg	64 U	60 U	67	60 U	66 U	62 U	61 U	64 U	91	62 U	63 U	180 U	63 U
High Molecular Weight Poly	ycyclic Aron													
Benzo(a)anthracene	μg/kg	64 U	60 U	62 U	60 U	66 U	62 U	61 U	64 U	63 U	62 U	63 U	180 U	63 U
Total Benzofluoranthenes	μg/kg	64 U	60 U	62 U	60 U	66 U	62 U	61 U	64 U	63 U	62 U	66	180 U	63 U
Semivolatile Organic Comp		-		-	-			-			-			
bis(2-Ethylhexyl)phthalate	μg/kg	64 U	60 U	62 U	60 U	66 U	62 U	61 U	64 U	63 U	62 U	590	180 U	63 U
Di-n-Butylphthalate	μg/kg	64 U	60 U	62 U	60 U	66 U	62 U	61 U	120	790	62 U	380	180 U	63 U

Notes:

- 1 Data qualifiers assigned independently by Informa LLC.
- 2 Duplicate sample
- 3 Only results for Aroclors 1242 through 1262 are shown. Other aroclors were analyzed, but were not detected.

Abbreviations:

bgs Below ground surface

ft Feet

mg/kg Milligram per kilogram

μg/kg Microgram per kilogram

Qualifiers:

- J Estimated value
- U Not detected
- UJ Not detected, estimated detection limit
- UY Not detected, used for complex mixtures that overlap

Table 6
CMP Investigation Geoprobe Groundwater Analytical Results—Detected Compounds¹

	ocation	T1B2	T1B3	T1B4	T2B2	T2B3	T2B3	T2B4	T3B2	T3B3	T3B4
		JF-T1B2-GW-15	JF-T1B3-GW-20	JF-T1B4-GW-20	JF-T2B2-GW-15	JF-T2B3-GW-15	JF-T2B3-GW-15-D ²	JF-T2B4-GW-20	JF-T3B2-GW-15	JF-T3B3-GW-15	JF-T3B4-GW-24
	ole Date		01/14/2011	01/14/2011	01/13/2011	01/13/2011	01/13/2011	01/13/2011	01/14/2011	01/13/2011	01/13/2011
Sample Depth	(ft bgs)	15	20	20	15	15	15	20	15	15	24
Parameter	Units		•		•						
Polychlorinated Biphenyls ³											
Aroclor 1242	μg/L	0.01 U	0.2 U	0.01 U	0.01 U	0.01 U					
Aroclor 1248	μg/L	0.01 U	0.014 UY	0.031 UY	0.01 U	0.01 U	0.01 U	1.8	0.01 U	0.01 U	0.01 U
Aroclor 1254	μg/L	0.01 U	0.022	0.054	0.01 U	0.01 U	0.01 U	2.5	0.01 U	0.018	0.01 U
Aroclor 1260	μg/L	0.01 U	0.011	0.01 U	0.01 U	0.01 U	0.01 U	0.2 U	0.01 U	0.017	0.01 U
Aroclor 1262	μg/L	0.01 U	0.2 U	0.01 U	0.014 UY	0.01 U					
Total PCBs	μg/L	0.01 U	0.033	0.054	0.01 U	0.01 U	0.01 U	4.3	0.01 U	0.035	0.01 U
Volatile Organic Compo	unds										
1,1,1-Trichloroethane	μg/L	0.3	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U				
Chloroform	μg/L	0.5	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U				
cis-1,2-Dichloroethene	μg/L	14	1.5	3	2.3	1.3	1.3	0.4	2.9	0.2 U	0.2 U
Tetrachloroethene	μg/L	1.2	0.2 U	0.2 U	0.2 U	0.8	0.8	0.2 U	0.2 U	0.2 U	0.2 U
trans-1,2-Dichloroethene	μg/L	0.5	0.2	0.2	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Trichloroethene	μg/L	130	3.1	5.2	0.5	4.4	4.5	1	6.4	0.6	0.2
Vinyl Chloride	μg/L	0.2 U	0.2 U	0.2 U	0.2 U	0.3	0.3	0.2 U	0.6	0.2 U	0.2 U

Notes:

- 1 Data qualifiers assigned independently by Informa LLC.
- 2 Duplicate sample.
- 3 Only results for Aroclors 1242 through 1262 are shown. Other aroclors were analyzed, but were not detected.

Abbreviations:

bgs Below ground surface

ft Feet

μg/L Microgram per liter

Qulaifiers:

- U Not detected
- UJ Not detected, estimated detection limit
- UY Not detected, used for complex mixtures that overlap

APPENDIX C STANDARD OPERATING PROCEDURES

PHASE 2 GEOPROBE SOIL INVESTIGATION WORK PLAN
Jorgensen Forge Outfall Site
CERCLA Docket No. 10-2011-0017
8531 East Marginal Way
Seattle, Washington

Farallon PN: 394-001

STANDARD OPERATING PROCEDURES

Appendix C of the Phase 2 Geoprobe Soil Investigation Work Plan

JORGENSEN FORGE OUTFALL SITE

CERCLA Docket No. 10-2011-0017 8531 EAST MARGINAL WAY SEATTLE, WASHINGTON

Submitted by:

Farallon Consulting, L.L.C. 975 5th Avenue Northwest Issaquah, Washington 98027

Anchor QEA, L.L.C. 720 Olive Way, Suite 1900 Seattle, Washington 98101

Farallon PN: 394-001

For:

Jorgensen Forge Corporation 8531 East Marginal Way Seattle, Washington The Boeing Company P.O. Box 3707 MC 9U4-26 Seattle, Washington 98124

February 2012

TABLE OF CONTENTS

SOIL S.	AMPLING PROCEDURES: BORINGS	2
SOP No	FAR-106	2
1.0	Purpose	2
2.0	Application	2
3.0	References	2
4.0	Equipment	2
5.0	Decontamination	
6.0	Soil Sampling Procedures	3
7.0	Documentation	5
РНОТО	DIONIZATION DETECTOR (PID) CALIBRATION AND OPERATION	6
	FAR-200	
1.0	Purpose	6
2.0	Application	
3.0	References	6
4.0	Equipment	6
5.0	PID Calibration	6
6.0	PID Drift	7
7.0	PID Operation.	7
8.0	Documentation	8
FIELD	MONITORING EQUIPMENT DECONTAMINATION PROCEDURE	8
	. FAR-300	
1.0	Purpose	8
2.0	Application	8
3.0	References	8
4.0	Equipment	8
5.0	General Decontamination Procedures	
6.0	Specific Decontamination Procedures	9
7.0	Documentation	9

SOIL SAMPLING PROCEDURES: BORINGS

SOP No. FAR-106

1.0 Purpose

The purpose of this SOP is to provide soil sampling personnel with an outline of the specific information needed to collect and document representative soil samples for chemical analyses from reconnaissance and monitoring well borings.

2.0 Application

This SOP provides step-by-step guidelines to be followed by the field sampling crew to assure consistent and representative sampling.

3.0 References

HAZWRAP, July 1990, Quality Control Requirements for Field Methods, DOE/HWP-69/RI.

United States Environmental Protection Agency, 1987, A Compendium of Superfund Field Operation Methods.

American Society for Testing Materials, 1989, Standard Method for Penetration Test and Split-Barrel Sampling of Soils, Method D-1586-84.

4.0 Equipment

The following equipment is necessary to properly collect soil samples:

- A PID to monitor and record the soil headspace readings.
- Soil sampling equipment (e.g., stainless steel spoons and hand trowels, brass or stainless steel sleeves complete with plastic end cap covers, pre-cleaned sample containers, Teflon tape, stainless steel mixing bowl, stainless steel hand auger, stainless steel hand-held drive sampler, post hole auger, wood or steel stakes), as needed.
- All required documentation including sample labels, field report forms, log of boring forms, and chain-of-custody forms.
- Personal protective equipment as described in the Site Health and Safety Plan.
- Decontamination equipment as specified in the SOP No. FAR 300.
- Sampling support equipment (e.g., sample coolers, ice/blue ice, bubble wrap, clear tape, duct tape, heavy resealable plastic bags, razor knives, garbage bags, paper towels, distilled water, nitril gloves), as needed.

5.0 Decontamination

All reusable equipment that will come in contact with soil cuttings or that is used to acquire soil samples will be decontaminated prior to arrival on site, between soil samples, relocation on site, and site exit. SOP No. FAR-300 shall be followed for equipment decontamination.

6.0 Soil Sampling Procedures

The soil sampling procedures have been developed for use during hollow-stem auger drilling methods. Specific drilling and soil sampling equipment used will be recorded on the boring log form and in the field report form.

Soil samples collected by direct-push drilling techniques will be collected using either split spoon samplers or tube samplers with the following specifications:

- Split Spoon 36-inch length SPT split spoon sampler with a 1.5-inch I.D. that can be used with or without 6-inch brass or stainless steel sleeves.
- Tube Sampler 22-inch length large bore tube sampler with a 1-inch I.D., which can be used with or without 6-inch brass/stainless steel sleeves or with a one piece polyethylene liner.

Soil samples collected by hollow-stem auger drilling methods will be collected using a standard 18-inch length (6-inch waste barrel) Dames & Moore split spoon sampler with a 2.5-inch I.D. that can be used with or without brass or stainless steel liners.

6.1 Set Up

Upon arrival at each boring site, the following procedures shall be followed:

- Suit up in appropriate PPE as described in the Site Health and Safety Plan.
- Set-up a temporary table adjacent to the drill rig to log and collect soil samples from soil cores as they are recovered during drilling. Lay plastic sheeting on the table to keep logging/sampling surface clean and prevent potential cross contamination between borings and soil samples. Designate clean areas for decontaminated sampling equipment and pre-cleaned soil sample containers.
- Set-up decontamination buckets (5-gallon) for decontaminating soil sampling equipment between soil samples. Drillers will provide buckets for their split spoons and core barrels. Use separate set of buckets for decontamination of soil sampling equipment. Refer to SOP No. FAR-300 for equipment decontamination.
- Calibrate PID to monitor headspace from selected soil samples (SOP No. FAR-200 for PID operation). Headspace readings will be collected for individual soil samples by placing the instrument probe in a sample jar or heavy resealable plastic bag containing a portion of soil sample and recording the reading on the Log of Boring form.

• Upon completion of a boring, measure the location of the boring from an on-site permanent datum.

6.2 Sample Collection

Sample collection procedures for lined and unlined split-spoon samplers, and tube samplers are described below.

6.2.1 Split Spoon Samplers

- Don clean nitrile sampling gloves prior to collecting each individual soil sample to avoid potential cross contamination from the prior sample and/or the decontamination of the sampling equipment.
- Insert pre-cleaned liners into a decontaminated split-spoon sampler, attach the sampler to the drill rod, insert into boring, and drive the samples the required length.
- Upon retrieval of the sampler, wipe off excess soil and/or drilling slough material from outside of sampler with clean paper towels then open the sampler and place the split spoons and drill shoe on the sampling table.
- Briefly examine the soil sample visually and by taking PID readings for obvious signs of contamination.
- Select the soil sample interval for laboratory analysis and transfer soil immediately
 to pre-cleaned sample containers using decontaminated stainless steel spoon.
 Completely fill container(s) to the top of container to minimize headspace and seal
 with a Teflon lid. Label the sample container and place it in a sampling cooler.
 Record sample information on a Chain-of-Custody form, boring log form and on
 the field report form.
- Remove the remaining soil sample from the split spoon, retain a portion of sample in a heavy resealable plastic bag or glass sample jar to measure headspace with the PID. Wait approximately 10 minutes prior to taking the measurement for headspace analysis using the PID. Insert the PID probe tip into a small opening in the top of the bag, and record the PID units on the boring log form.
- Examine the remaining soil sample for lithology using the Unified Soil Classification System (USCS) and record the lithology on the boring log form.
- Discard excess soil cuttings into a drum or soil bin.
- Decontaminate the soil sampling equipment and split spoons, and don a clean pair of sampling gloves prior to collection of the next soil sample.

6.2.2 Tube Sampler

- The same soil sampling procedures for split spoons will be used for the tube sampler with the exception that the lined tube sampler can also utilize a one-piece polyethylene liner instead of the 6-inch brass or stainless steel liners.
- When using one-piece polyethylene liners, select the soil sample interval and cut the liner with a razor knife.

7.0 Documentation

All soil sampling activities should be documented on the Log of Boring, Chain-of-Custody form, and in the detailed Field Report form.

PHOTOIONIZATION DETECTOR (PID) CALIBRATION AND OPERATION

SOP No. FAR-200

1.0 Purpose

The purpose of this SOP is to provide field personnel with step-by-step instructions on the proper use, operation, and handling of the Perkin-Elmer Photovac Air Monitor/Portable Photoionization Detector (PID), Model 2020. The operation and maintenance manual specific to this piece of equipment should be referenced, as necessary.

2.0 Application

The PID is used as a field screening instrument for measurement of total volatile organic (TVO) concentrations in air. Typical uses include air monitoring of the breathing zone for health and safety purposes, groundwater and soil screening for TVO emissions, and well headspace.

The PID is a highly sensitive instrument with an operating range of 0.1 to 2,000 parts per million (ppm) hexane equivalent. Its detection limit is 0.1 ppm hexane or isobutylene and its response time is less than 3 seconds.

3.0 References

PE Photovac Air Monitor/Portable Photoionization Detector (PID), Model 2020 Manual (2000).

4.0 Equipment

The following equipment is necessary to calibrate and use the PID:

- PE Photovac Air Monitor/Portable Photoionization Detector (PID), Model 2020 (PID).
- A calibration gas regulator.
- Calibration gas containing approximately 14 ppm hexane or isobutylene, and zero gas which contains no ionizable gases or vapors.
- A 110-volt battery charger.

5.0 PID Calibration

The PID should be calibrated at least daily and more if wet conditions are encountered, or as necessary. The following calibration procedures should be followed:

- Connect the regulators to the gas cylinders. Connect the adapter tubing to the regulators.
- Connect the PID sample probe to the PID.
- Turn the PID on by pressing ON/OFF. Wait for the PID to proceed to the default display. Allow it to warm up according to manufacturer's instruction (10 minutes).
- Press the ENTER key.

- Expose the PID to a supply of zero air by connecting the adapter tubing to the probe and opening the valve.
- Select "Set," "Cal" and then "Zero." Allow the PID to set its zero point.
- Select "Set," "Cal" and "Span." Enter the known span gas concentration, without pressing ENTER to confirm it.
- Expose the PID to a supply of span gas by connecting the adapter tubing to the probe and opening the valve. Press the ENTER key.
- When the display reverts to the default display, the PID is calibrated and ready for use.
- Values read by the PID when calibrating with zero gas and hexane should be recorded in a calibration book or the log field book in use at that time.

6.0 PID Drift

The drift from the initial daily calibration shall be measured and recorded at least daily or more if conditions warrant. This is done by exposing the PID to the calibration gases, and recording the reading for each of these gases in the calibration or log field book.

7.0 PID Operation

The following procedures should be followed when monitoring the breathing zone for Health and Safety purposes, groundwater and soil screening for TVO emissions and well headspace:

- Connect the PID sample probe to the PID hand-held Air Monitor.
- Turn the PID on by pressing ON/OFF. Wait for the PID to proceed to the default display. Allow it to warm up according to manufacturer's instructions (10 minutes).
- When monitoring the breathing zone for Health and Safety purposes, allow the PID to monitor the air quality at the breathing zone, chest or face level, and read the meter display that shows the detected concentrations.
- When monitoring groundwater and soil for TVO emissions, place the probe inlet near the surface of the groundwater or soil and read the meter display that shows the detected concentrations. Be cautious not to allow water or soil to be sucked into the instrument.
- When monitoring for the headspace of a monitoring well, monitor the headspace directly after opening the well. Place the probe inlet directly above the PVC or dedicated pump top within the well. Read the meter display that shows the detected concentrations.
- If an increasing meter reading is indicated, monitor until the maximum meter reading is obtained and leave the probe inlet in that position for approximately six seconds.
- Humidity or moisture from rain can cause large fluctuations in PID readings. It is essential that the PID remains dry at all times while in use. Moisture can cause inaccurate readings and damage the PID.

• If the PID is showing erratic readings, then it is possible that there is either moisture or dirt in the probe, or dirt has collected in the filter. If this occurs, clean and dry the sample probe by running zero gas backwards through it, and replace the filter if necessary (with attention to placing the filter shiny-side down towards the monitor).

8.0 Documentation

All PID measurements for all monitoring events should be documented on field forms and in a detailed field notebook. Observations of varying weather conditions such as temperature and humidity fluctuations should also be recorded.

FIELD MONITORING EQUIPMENT DECONTAMINATION PROCEDURE

SOP No. FAR-300

1.0 Purpose

The purpose of this SOP is to provide field personnel with an outline of the procedure and frequency of decontaminating field monitoring equipment that has come into contact with groundwater.

2.0 Application

This SOP provides a step-by-step guideline to be followed by the field sampling crew to prevent cross-contamination between wells and preserve well integrity.

3.0 References

RCRA Groundwater Draft Technical Guidance (EPA 1992).

4.0 Equipment

The following equipment is necessary to properly decontaminate equipment used for soil sampling, and installing, purging, and sampling wells.

- Alconox and paper towels.
- A clean hose and tap water source.
- A labeled 55-gallon drum for wastewater and a bucket to use for smaller volume prior to containing in drum.
- Personal protective equipment as described in the Site Health and Safety Plan.

5.0 General Decontamination Procedures

All reusable equipment that will come in contact with the well and/or be used to acquire samples will be decontaminated prior to arrival on site, relocation on site, and site exit.

5.1 Decontamination

• Wash the equipment with a solution of nonphosphate detergent (Alconox or equivalent) and water.

- Rinse the equipment with tap water (if using Alconox).
- Rinse the equipment with De-Ionization (DI) water.

6.0 Specific Decontamination Procedures

Specific decontamination procedures for each type of equipment that is anticipated for use in the Remedial Investigation is described below.

6.1 Soil Sampling Equipment Decontamination Procedure

After collecting a sample using the hand auger, split-spoon or tube sampler, or stainless-steel hand sampling equipment, follow the decontamination procedure that follows:

- Brush off any soil clinging to the equipment;
- Rinse the equipment with Alconox dissolved in tap water.
- Rinse the equipment with DI water.

6.2 Groundwater Sampling Equipment Decontamination Procedures

After sampling or developing a well using a surge block, water level meter, or non-dedicated submersible pump, decontaminate the equipment as follows:

- Rinse exposed equipment parts with Alconox dissolved in tap water.
- Rinse exposed equipment parts with DI water.
- Discard non-reusable tubing, as necessary.

7.0 Documentation

All decontamination procedures associated with monitoring well activities should be documented in the field notebook.

APPENDIX D FIELD DOCUMENTATION FORMS

PHASE 2 GEOPROBE SOIL INVESTIGATION WORK PLAN
Jorgensen Forge Outfall Site
CERCLA Docket No. 10-2011-0017
8531 East Marginal Way
Seattle, Washington

Farallon PN: 394-001



FIELD REPORT

			Page of
Date:	Project #:	Task #:	
Project:		Site Address:	
Client:		Contractor:	
Weather:		Temp:	
Equipment Used: _			
		Project Manager:	****
Contractor	Staff		
Prepared By:		Reviewed By:	
Comments:			
***************************************	· · · · · · · · · · · · · · · · · · ·		·
*			



FIELD REPORT (continued)

			Page of
Project:	Date:	Project #:	Task #:
			······································

	1505057/1			32	LLON CONSULTI 20 3rd Avenue NE saquah, WA 98027	Log of Borning.	Page of							
Client: Project: Location: Farallon PN: Logged By:						Date/Time Started: Date/Time Completed: Equipment: Drilling Company: Drilling Foreman: Drilling Method:	oring:							
Depth (feet bgs.)	Sample Interval	% Recovery	Blow Counts 8/8/8	PID (ppm)	Sample ID Sample Time	Lithologic Description	nscs	Depth (feet bgs)						
5—			Гуре:			Total Boring Depth (ft bgs):		10-						
	Dri	ve H	ammer (I f Water /		bgs):	Total Well Depth (ft bgs): E:\Forms\Bo\text{Bo\text{lerplates\LogPlot\Templates}}	ates\FieldLo	og						

T

SOIL SAMPLE DATA

:						PROJECT NO:			SHEET	OF
TION:										
ERIAL NO:							CALIBRATIC	ON DATE/STANDA	RD:	
NTAINER:		16 OZ GLASS		8 OZ GLASS	4 OZ GLASS	ZIP-LOC				
DD:		SONIC		HAND AUGER	☐ HOLLOW STEM	SPLIT SPOON		☐GEOPROBE	BACKHOE BU	CKET
		TAP WATER WASH	□DIST/D	EION 1 RINSE	☐ ISOPROPANOL		ANALYTE I	FREE FINAL RINSE		
		ALCONOX WASH		UINOX WASH	DIST/DEION 2 RINSE	OTHER SOLVENT	☐ DIST/D	EION FINAL RINSE	☐AIR DRY	
DATE	i .		DEPTH	TIME	STAINING	ODOR	PID	SHEEN		LITHOLOGIC DESCRIPTION REMARKS
-										
					CONTRACTOR CONTRACTOR					
		-								
										-

						_				
Forms\\Soil Samp	le Log xisx\SOILSAMPLE	LOG							PREPARED BY:	
	DATE	TION: :RIAL NO: NTAINER: D: SAMP NUMBER OF	TION: :RIAL NO: NTAINER:	TION: IRIAL NO: INTAINER:	TION: FIAL NO:	TION: ERIAL NO: INTAINER:	TION: IRIAL NO: NTAINER: 16 OZ GLASS 8 OZ GLASS 4 OZ GLASS 2IP-LOC DE	TION: RIAL NO:	TION: RIAL NO:	TION. FIREL NO.

WASTE INVENTORY TRACKING SHEET

Project Number: Project Name: Project Address: Field Work: Project Manager:			-	Date: Prepared By:		Page	of	
			Date(s)		Sampled			
Container ID	Fullness	Contents/Origin	Accumulated	Labled (Y/N)	(Y/N)		Comments	
							-	

NOTES: Contents should be specified and include identification of well/boring, media, souce, depth of soil (if applicable), and any other applicable information.

